Chemical Week

November 24, 1956

Price 35 cents

Steroid sales should spurt now that Parke, Davis has licensed patents to Syntex . . . . . p. 22

Behind Montreal's chemical boom: Seaway power and water, expanding mineral output . . p. 29

Plastic 'solders' move into industrial jobs, seek to cash in on big new sales potential . . . . . p. 42

Low duties on U.S.-bound shipments is big lure in Puerto Rico's courting of European investors . . . p. 78

Sell townfolk on the idea first if you want to build your research lab in the suburbs . . . . . p. 98

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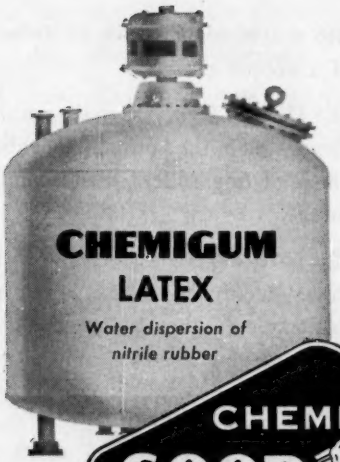

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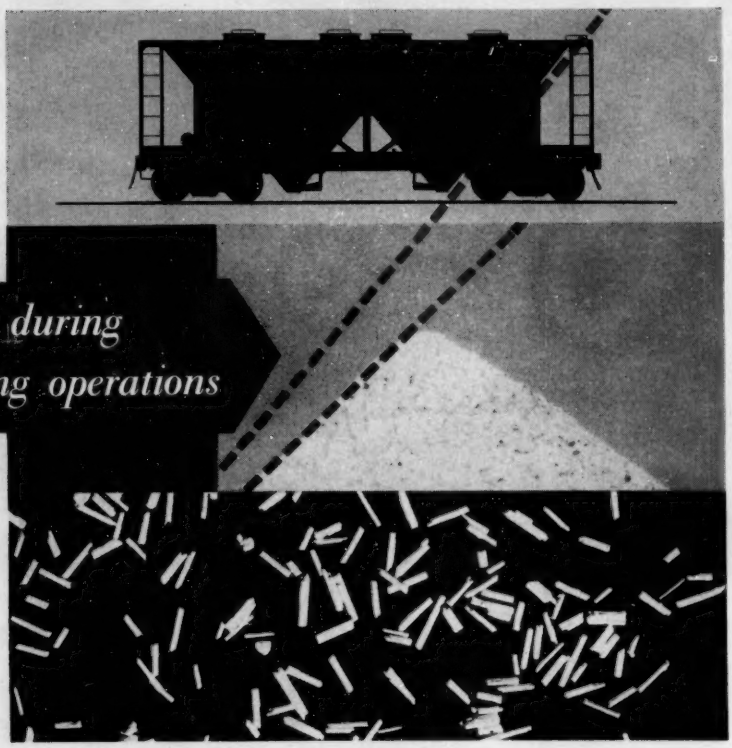

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Chemical Week

TOP OF THE WEEK **November 24, 1956**

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November 24, 1956 *Vol. 79, No. 21*

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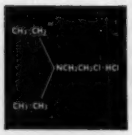

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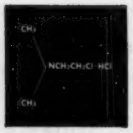

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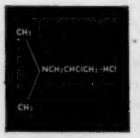

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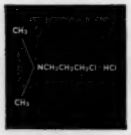

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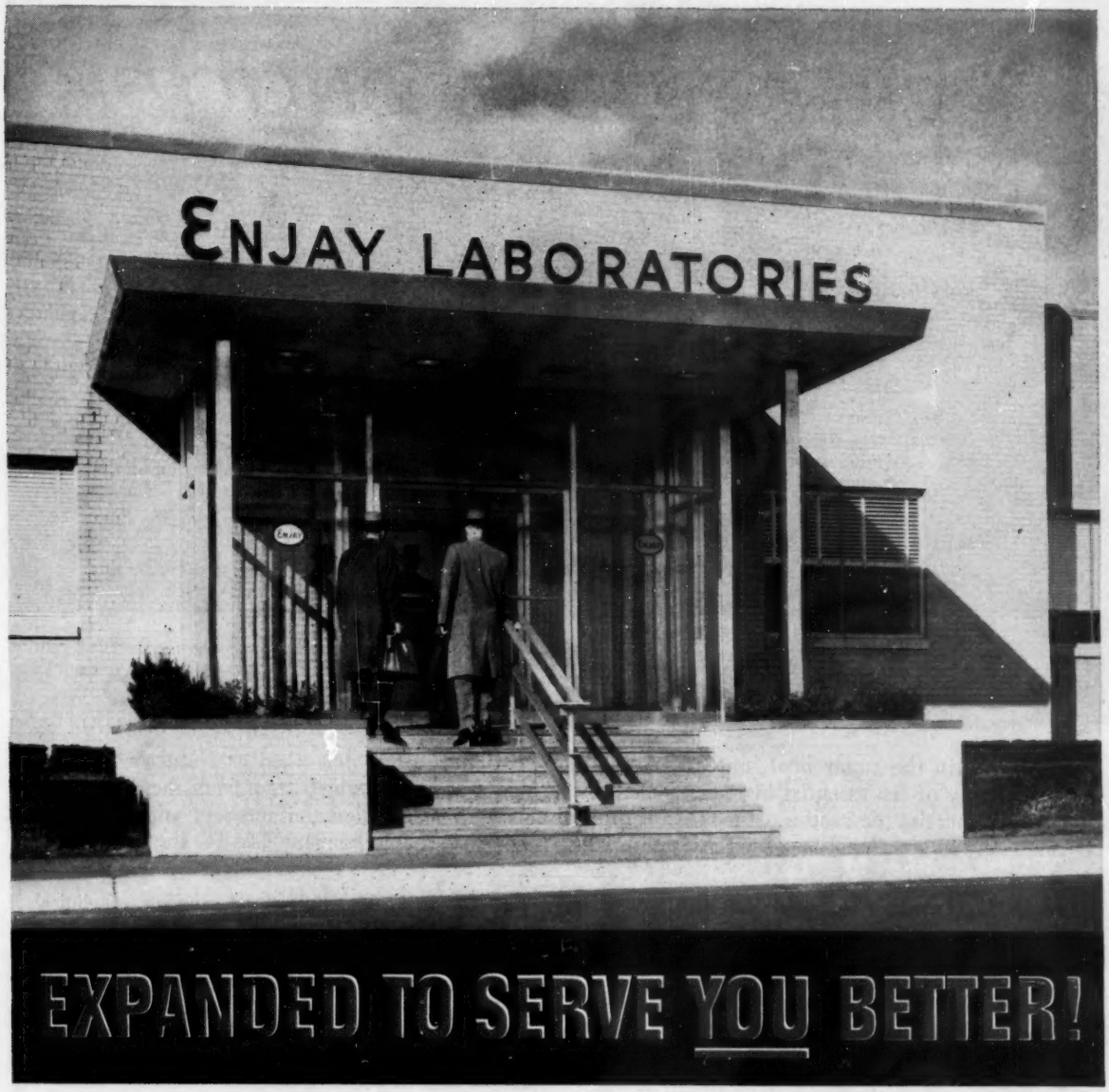

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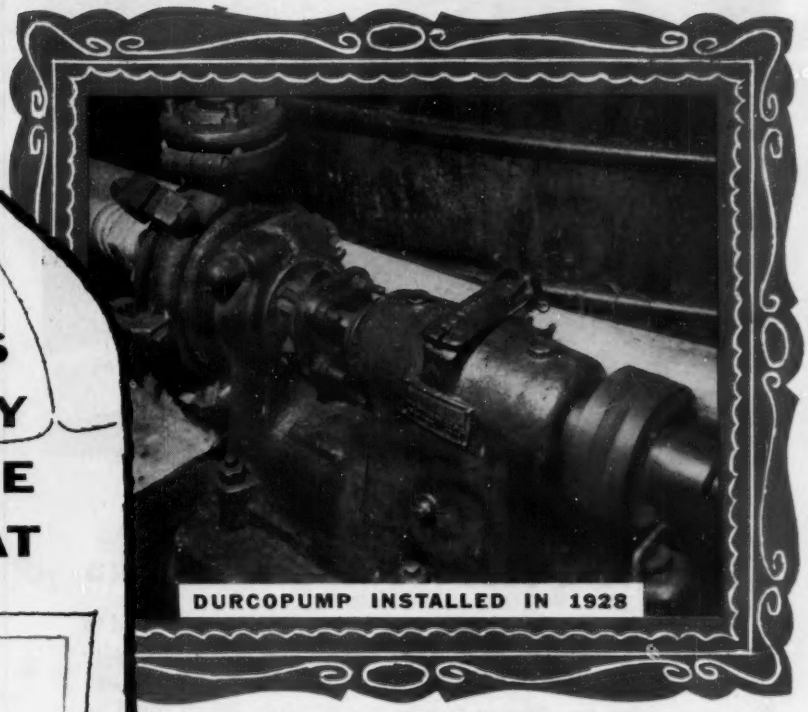
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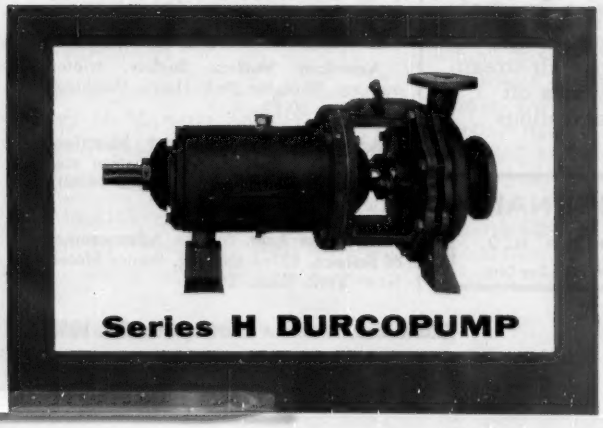

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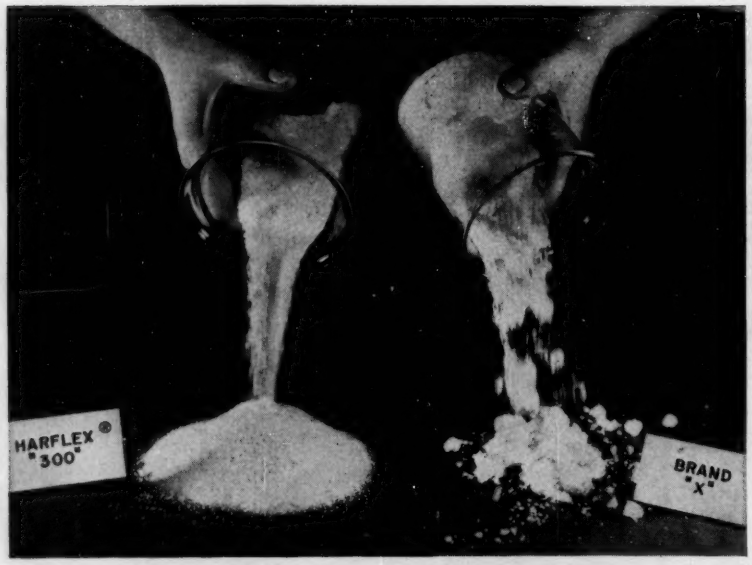

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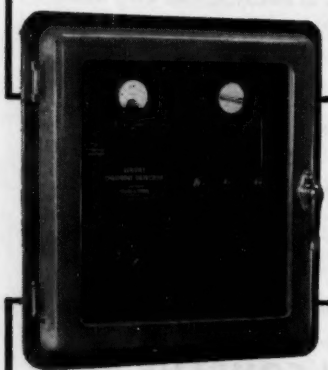

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OPINION

Pesticide Report: $1.50

TO THE EDITOR: We have read the excellent report on the pesticide market written by Mr. Carl D. Fischer of Carbide and Carbon Chemicals Co. The first installment appears to be a comprehensive report written by a man who obviously has made a tremendous study of the market and has treated the subject most thoroughly.

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Single copies of the entire three-part report sell for $1.50, 11 to 50 copies @ $1.30, 51 to 1,000 @ $1.10.—ED.

MEETINGS

American Institute of Consulting Engineers, annual dinner, Waldorf-Astoria. New York, Nov. 27.

American Chemical Society, 9th National Chemical Exposition, Cleveland Public Auditorium, Cleveland, Nov. 27-30.

International Ozone Conference, Hotel Sheraton, Chicago, Nov. 28-30.

Synthetic Organic Chemical Manufacturers Assn., annual meeting, Biltmore Hotel, New York, Dec. 3.

Chemical Specialties Manufacturers Assn., 43rd annual meeting, Mayflower Hotel, Washington, Dec. 3-5.

Air Pollution Control Assn., semi-annual meeting, Rice Hotel, Houston, Dec. 3-5.

Society of the Plastics Industry, Inc., 7th film, sheeting and coated fabrics division conference, Commodore Hotel. New York, Dec. 4-5.

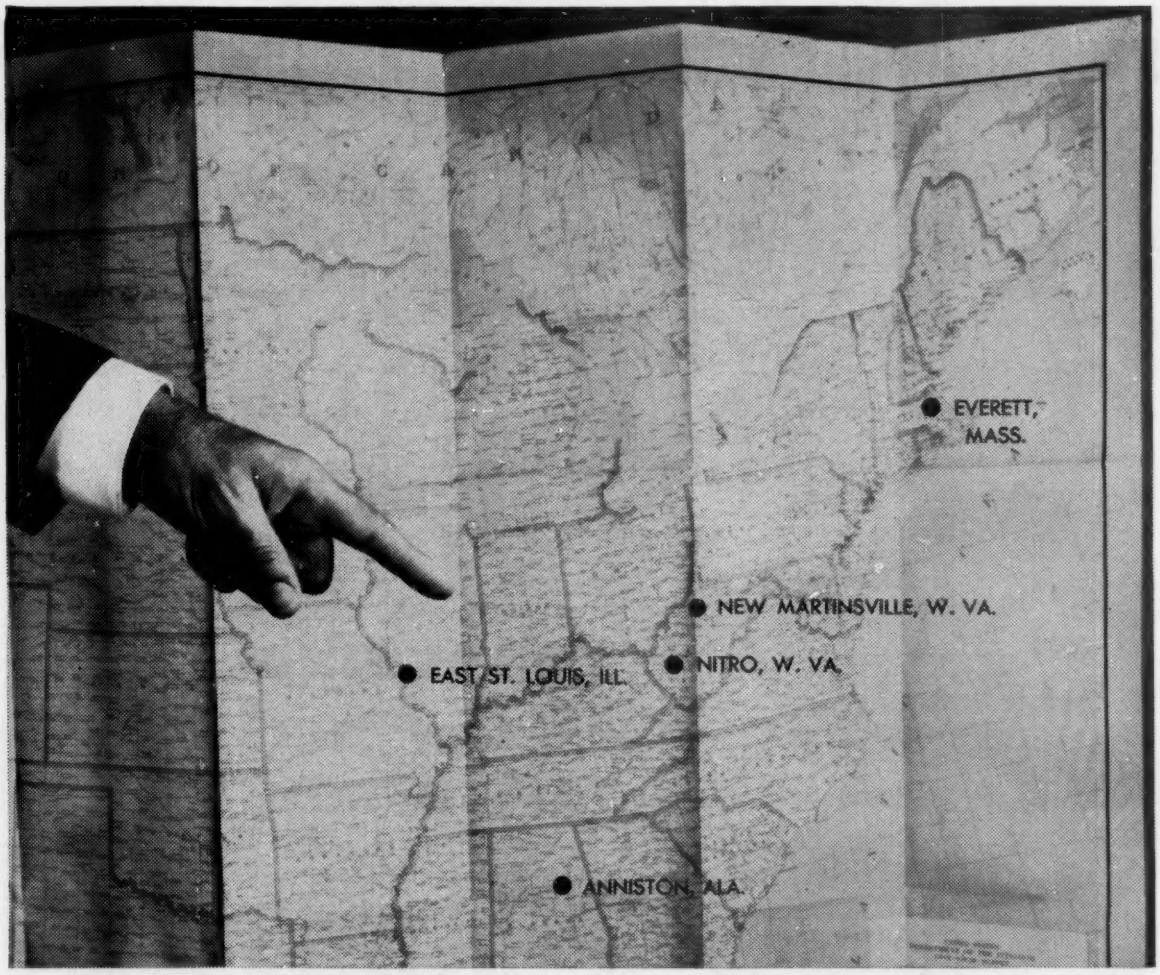
American Institute of Chemical Engineers, annual meeting, Statler Hotel. Boston, Dec. 9-12.

American Nuclear Society, winter meeting, Sheraton-Park Hotel, Washington, Dec. 10-12.

American Pharmaceutical Manufacturers' Assn., midyear and eastern section meeting, Waldorf-Astoria Hotel, New York, Dec. 10-12.

American Assn. for the Advancement of Science, 123rd meeting, Statler Hotel, New York, Dec. 26-31.

GOOD NEWS IF YOU'RE EAST OF THE MISSISSIPPI



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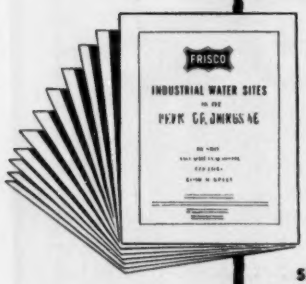

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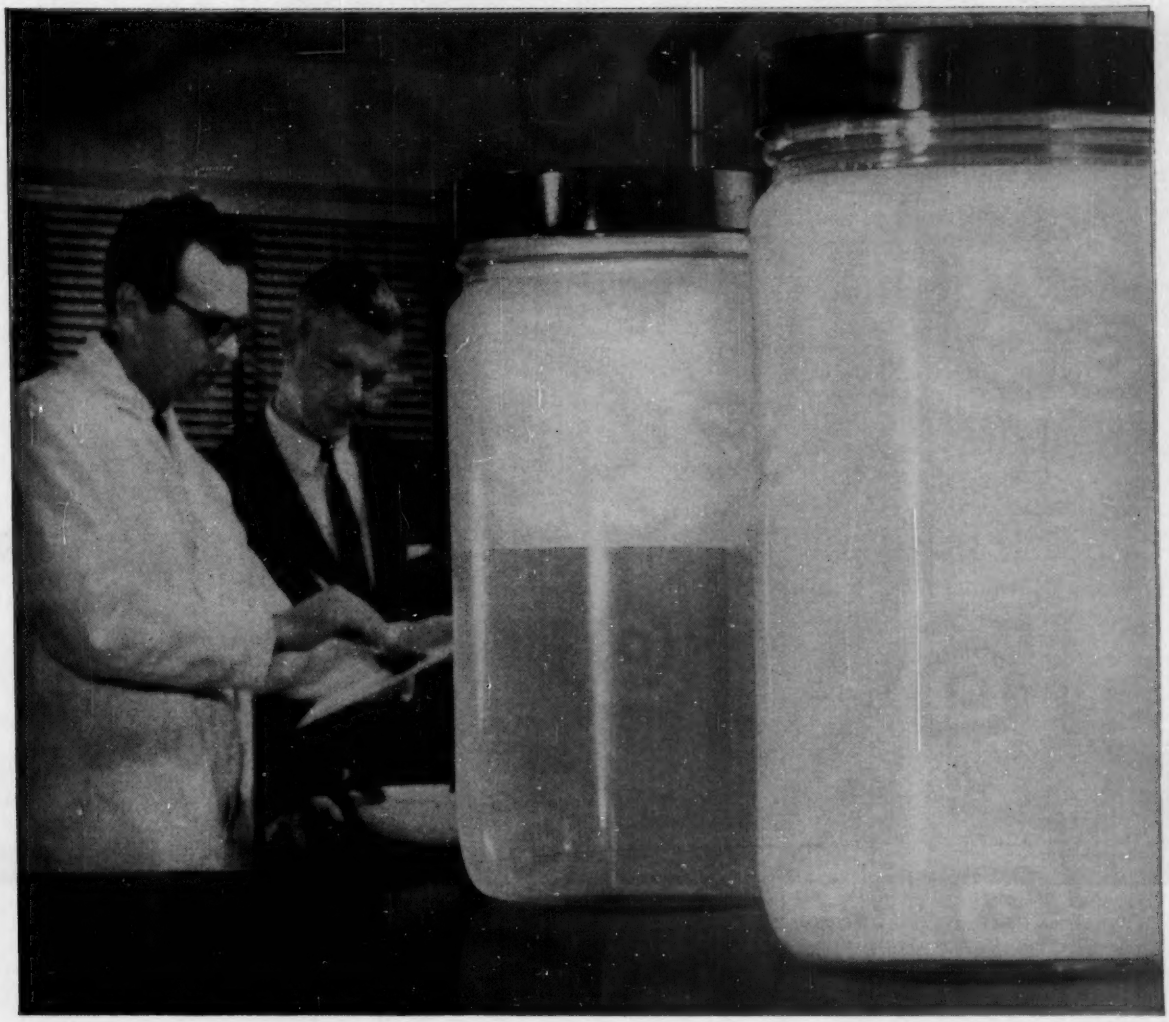

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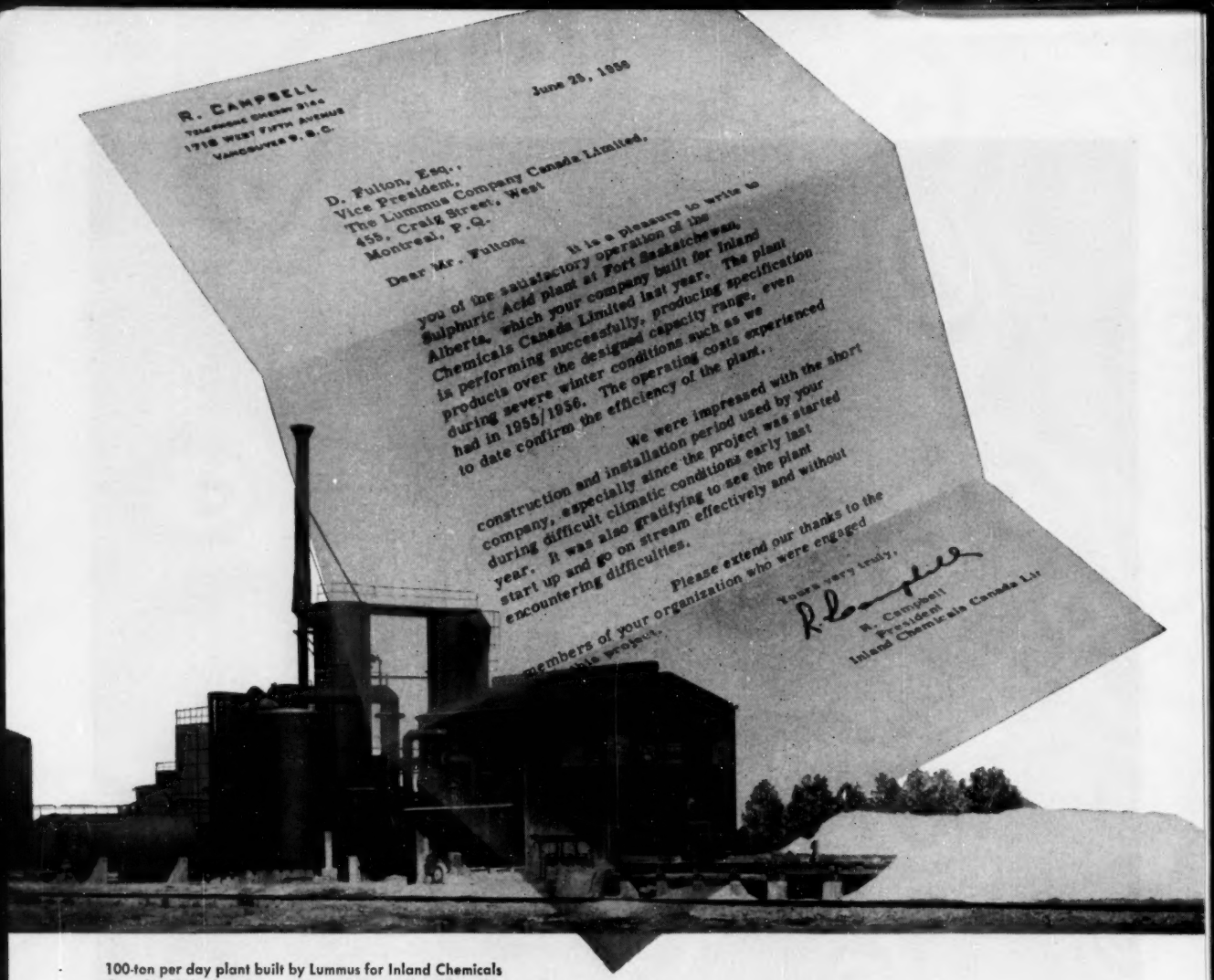
R. CAMPBELL
1716 WEST FIFTH AVENUE
VANCOUVER 9, B.C.
June 25, 1956
D. Fulton, Esq.,
Vice President,
The Lummus Company Canada Limited,
455, Craig Street, West
Montreal, P.Q.
Dear Mr. Fulton,
It is a pleasure to write to
you of the satisfactory operation of the
Sulphuric Acid plant at Fort Saskatchewan,
Alberta, which your company built for Inland
Chemicals Canada Limited last year. The plant
is performing successfully, producing specification
products over the designed capacity range, even
during severe winter conditions such as we
had in 1955/1956. The operating costs experienced
to date confirm the efficiency of the plant.
We were impressed with the short
construction and installation period used by your
company, especially since the project was started
during difficult climatic conditions early last
year. It was also gratifying to see the plant
start up and go on stream effectively and without
encountering difficulties.
Please extend our thanks to the
members of your organization who were engaged
this project.
Yours very truly,
R. Campbell
President
Inland Chemicals Canada Ltd

100-ton per day plant built by Lummus for Inland Chemicals Canada Limited went onstream 9½ months after the contract was signed, 7 months after field work began.

This sulfuric acid plant was—

Finished fast... started smoothly... is going fine!

Winter is rugged at Fort Saskatchewan, Alberta. In spite of it, this $1,000,000 sulfuric acid plant built there by Lummus was completed well ahead of schedule, and was making specification product within 12 hours of startup.

That was a year ago. Since then this plant has been producing to specification over a range of capacities from 45 to 125% of design.

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LUMMUS

ENGINEERS AND CONSTRUCTORS FOR INDUSTRY

Business Newsletter

CHEMICAL WEEK
November 24, 1956

Watch Westinghouse—and Union Carbide Nuclear. They're getting together to enter the atomic fuel fabrication and reprocessing field. Whereas Sylvania Electric and Corning Glass (*see p. 23*) are forming a jointly owned subsidiary to enter—at least for the present—only the fuel element fabrication field, Westinghouse-Carbide also plans to handle reprocessing of spent atomic fuel to remove fission products that "poison" fuel materials and plutonium or other fuel produced in the atomic reactor. Westinghouse-Carbide will first offer its services in reprocessing homogeneous fuel mixtures, later process a wider range of fuels.

Also in the news this week:

Standard Oil of Indiana will erect a phthalate production unit that will cost approximately $10 million (*see p. 75*)

Alberta will get a steel plant and coal chemical production center at Burmis if present plans of a Canadian-French investment group work out. Both coal and iron ore are found in the area.

Cornwall Chemicals Ltd., jointly owned by Canadian Industries Ltd. and Stauffer Chemical, will expand its production of such materials as carbon bisulfide. Part of the expansion money will come from sale of some $250,000 worth of new common stock to Stauffer and a similar amount to CIL. Cornwall registered the increase in capital stock with the Canadian government at Ottawa.

Monsanto, now second-largest U. S. producer of phenol, plans a 25% boost in its capacity for the intermediate, will spend "several million dollars" on new units at Monsanto, Ill. They will come onstream during the second half of '58.

Dow Chemical has big plans for its Louisiana plant complex. It has asked for a 10-year exemption from local property taxes for an $11-million electric power plant to be built at its Plaquemine, La., location. Other firms asking exemptions in Louisiana for new plants: Copolymer Rubber and Chemical, for a $1.9-million project; Oronite Chemical, for a $1.2-million plant.

Pennsalt will acquire Delco Chemicals, Inc. (Los Angeles), pointing up that though much of Pennsalt's expansion money has been going into basic chemicals, the company is still interested in its chemical specialty lines. Acquisition of Delco, which has plants at Los Angeles and Dallas, gives Pennsalt production centers in five major market areas for such specialty items as metal cleaners, paint strippers, industrial maintenance products.

•

Final arguments on the Du Pont-General Motors antitrust case were heard by the U. S. Supreme Court last Thursday. The Justice Dept. is

appealing a decision in Chicago by District Judge Walter LaBuy dismissing the government's antitrust suit. LaBuy held that Du Pont's 23% stock ownership in GM did not represent a restraint of trade. The government contended that since 93% of General Motors' paint purchases were from Du Pont and that since 80% of Du Pont's fabric sales to the auto industry went to GM, there was restraint of trade.

In reply, company attorneys pointed out that GM made its purchases on the basis of judgments of many individual purchasing agents who did not consult top management in deciding what to buy.

The Supreme Court is expected to decide whether to grant the government's appeal before it adjourns next summer.

Elsewhere on the legal scene, Rayonier has been named defendant in eight damage suits that ask $841,511 on grounds that effluent from Rayonier's Shelton, Wash., pulp mill has been killing Puget Sound oysters.

•

Hooker Electrochemical's independent union will represent Hooker employees at Hooker's original Niagara Falls plant and at the plant there that was operated by Niagara Alkali. By a 3-to-1 vote, workers decided to have the independent union bargain for them, rather than the local of Oil, Chemical and Atomic Workers (AFL-CIO), which had represented Niagara (*CW, Nov. 3, p. 24*).

A move against officers of another union, meanwhile, has been labeled a "union-busting" scheme. International Union of Mine, Mill and Smelter Workers (Ind.) made this comment on the indictment of 14 of its officers and staff members for falsely denying membership in the Communist party.

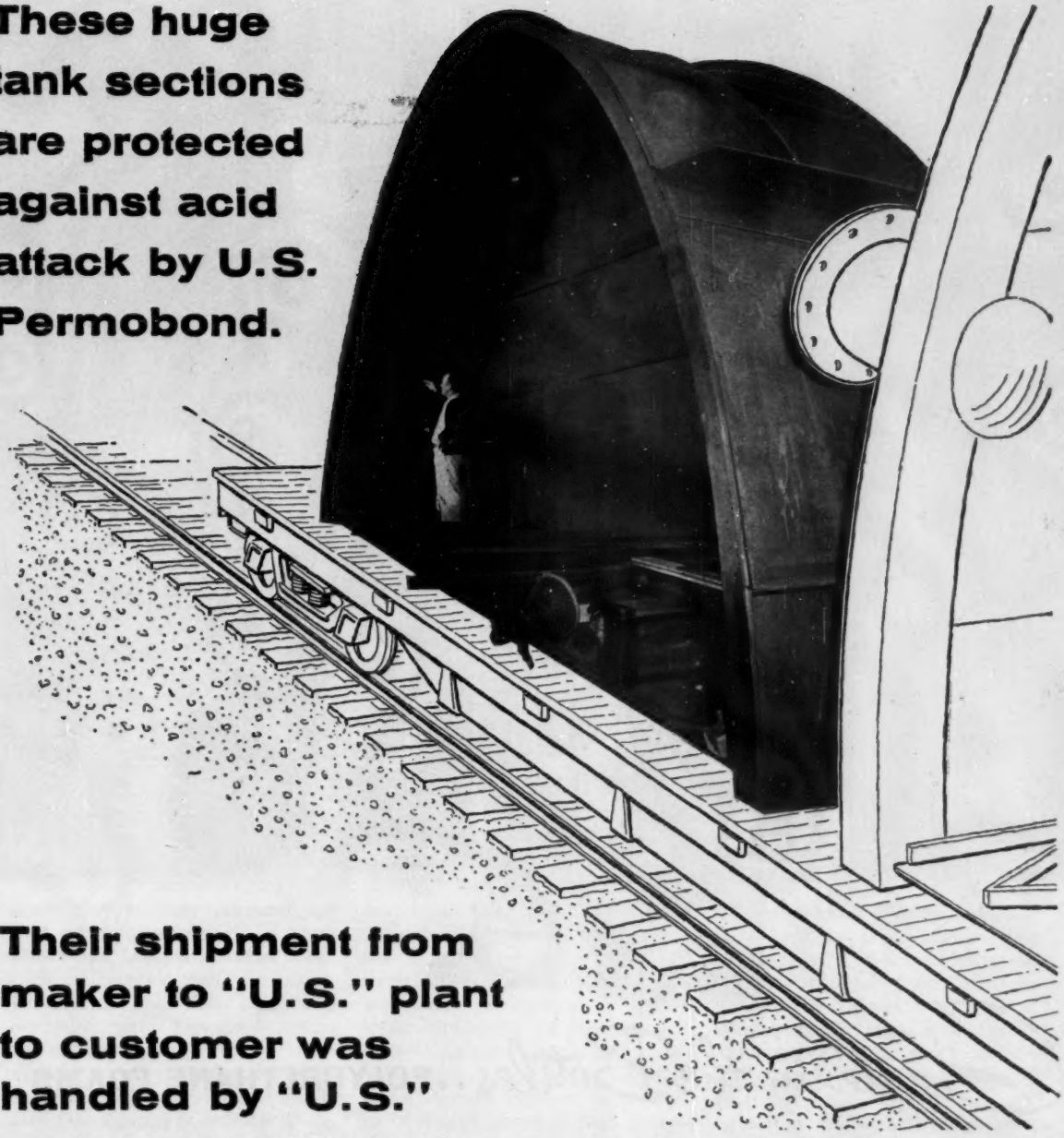
•

A proposed model building code covering plastics is out from under wraps this week. The proposal, drawn up by the Manufacturing Chemists' Assn. and the Society of the Plastics Industry, was made public at MCA's semiannual meeting this Tuesday. In telling of the code, Rohm & Haas's Frederick Rarig pointed out that chemical and plastics sales for building usage would continue to be delayed and efforts wasted unless such a unified approach were followed—rather than a piecemeal effort to get each local authority to adopt a specific building code amendment for each specific plastic use.

•

Minor memos—Procter & Gamble has come up with a new variation of the colored detergent idea. It's testing Blue Dot Duz in Richmond, Va.—a product that contains both blue and white granules. . . . The chemical industry will vanish from the U. S. industrial scene as a discrete unit within the next 25 years, predicts Monsanto's John Gillis. It's merging in with such other industries as petroleum, rubber, metallurgy, and will soon, Gillis thinks, no longer stand out by itself.

These huge tank sections are protected against acid attack by U.S. Permobond.



Their shipment from maker to "U.S." plant to customer was handled by "U.S."

The expansion plans of a Southern chemical plant called for the design of a processing tank that was so huge it could not be shipped in one piece.

So the steel fabricator's engineers, working with "U.S." engineers, designed the tank in 2 parts. The tricky task of transporting these immense sections from the fabricator to the "U.S." plant (where U.S. Permobond protective linings were installed) and from there to the chemical plant was *arranged* by "U.S." traffic specialists. When the 2 sections arrived at the chemical plant, "U.S." field service men vulcanized the joints after the halves were welded together, making a complete rubber lining with no seams or joints. Thanks to the Permobond® lining, the tank is immune to acid attack.

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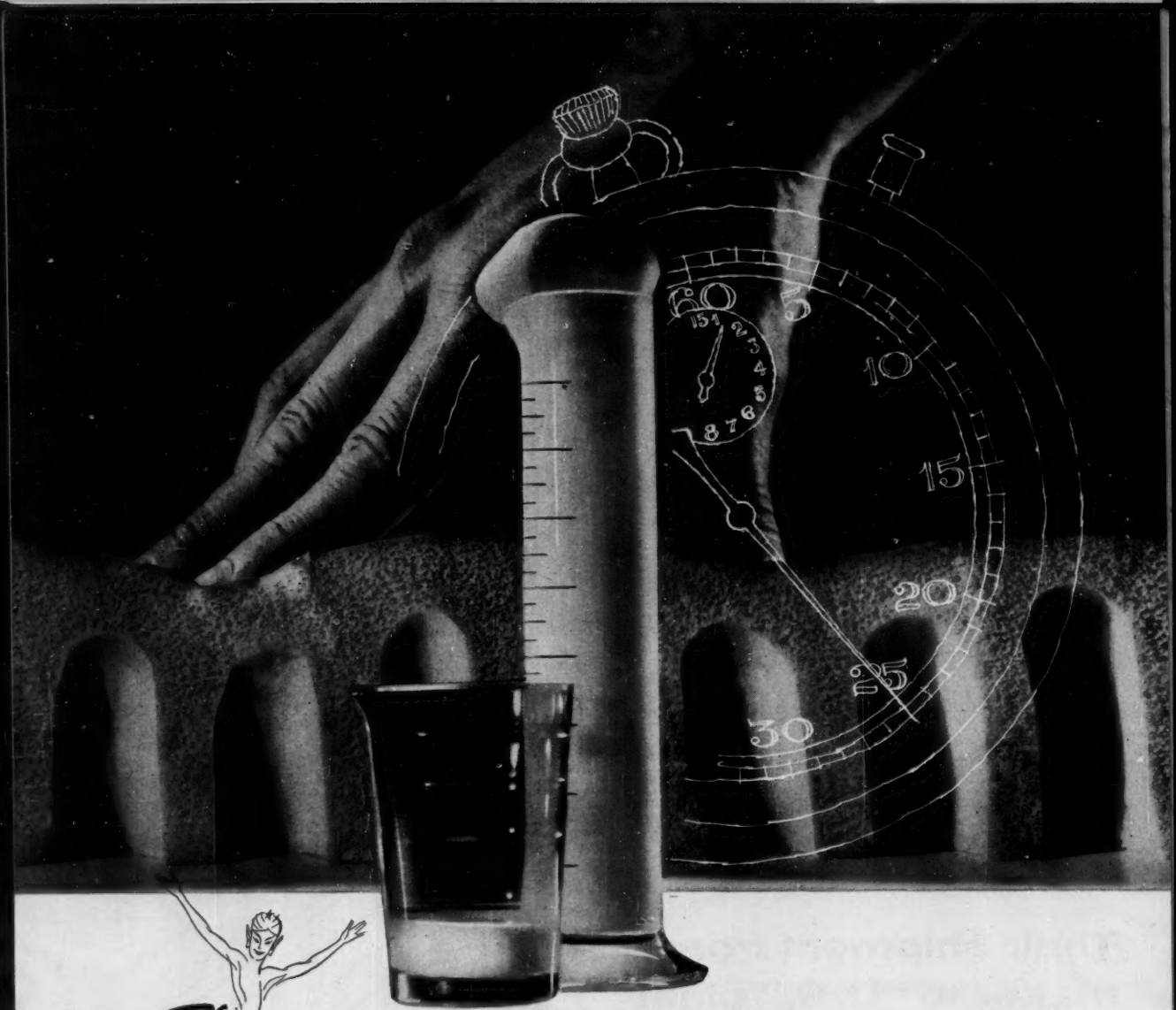

Genie in the Bottles..POLYURETHANE FOAMS

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A hundred-and-one industries already are prime markets for the producers of polyurethane foams. And the number is growing daily as manufacturers discover their many advantages—particularly the advantage of flame resistance which is imparted to the foams by the addition of a plasticizer such as Celanese Celluflex CEF.

In continuous commercial volume Celanese also produces trimethylolpropane . . . a high purity polyol with proven cross-linking properties . . . as well as propylene glycol and 1, 3 butylene glycol. These results of applied research are solving many problems in making the new polyurethane materials ever more useful and economical. Celanese Corporation of America, Chemical Division, Dept. 652-K, 180 Madison Avenue, New York 16, N. Y.

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Empty New Jersey berths signal dockers' strike as chemical shippers wait out the uncertainties of East Coast portside labor contract negotiations.

The Dock Strike: No Good for Chemicals

Overseas and coastal chemical shipments were seriously disrupted last week when longshoremen at North Atlantic and Gulf ports went on strike.

Export-importers and shippers of solid and drummed liquid cargo were especially hurt. Tankage chemical movement that did not require stevedoring services or use piers controlled by International Longshoremen's Assn. (Ind.) was generally unaffected.

The strike caught chemical process and other industries by surprise, since settlement of the dispute between the ILA and shipping companies had been expected to be reached without a walkout. Thus, many companies had failed to establish adequate inventories.

If the strike lasts, the chemical industry will be hurt, and hurt hard. Already, one major supplier plans to close two plants, another is making arrangements for emergency rail shipment, but because of rail car shortage and time and distance factors, deliveries will be a week late.

Hopes are high, however, that the walkout will be brief. Both the union and the shipping companies are negotiating, and agreement has been reached on about half of the important demands. Then, too, federal intervention is anticipated if the strike continues. The government has a considerable stake in effecting a speedy settlement: foreign aid shipments and surplus agricultural commodity disposal would be imperiled by a lengthly strike. A third pressure for a short strike is also operating. High demurrage charges—in some cases, thousands of dollars/day—are piling up on immobilized ships.

Government Action? Will the government try to settle the strike by asking for a back-to-work injunction under the Taft-Hartley Act? As *CW* went to press, such action was not thought to be immediately forthcoming. However, the government has indicated it may act if the strike lasts much over a week.

Unlike past strikes, which usually tied up only the Port of New York, the current walkout has closed most Eastern seaboard and Gulf Coast docks, thus preventing use of alternate shipping facilities. This development has broad significance, for it indicates that union locals are willing to join forces with the gangster-ridden New York unions. If ILA succeeds in getting all-port bargaining authority (one disputed key demand), New York influence could dominate the Eastern and Gulf Coast ports, make them more subject to the frequent labor disturbances that plague New York.

Such a development, too, would remove much of the incentive for a company to permanently switch shipping operations from New York to other ports. Freedom from costly labor trouble has been one of the arguments used by other ports to counter New York advantages in facilities, banking services and frequent, direct sailings.

Regardless of the specific terms of the settlement, chemical companies will no doubt feel at least one effect: higher shipping rates are sure to stem from the new contracts. This may cause chemical price increases and perhaps jeopardize sensitive sales positions in export markets. Short or long, the strike bodes no good for the chemical industry.

SYNTEX'S LAGOS, ZAFFARONI: Barbasco controversy portends . . .

Sticky Times for Steroids

Syntex, S.A., American-controlled Mexican hormone manufacturer, has moved back into the spotlight. It has completed arrangements with Parke, Davis & Co. to license P,D-held patents covering production of steroid hormone intermediates from the Mexican roots, which it harvests.

Parke, Davis reportedly is on its way to a major move into steroid hormone marketing and has received, in turn, rights from Syntex to the latter's product patent on 19-*nor*-ethisterone, an oral form of progesterone. Armed with such a specialty item, and with licenses to Syntex's patents in the Δ^1 field,* P,D could well hope to compete with G.D. Searle's Nilevar and challenge the strong hormone positions of Schering, Merck, Pfizer, and Upjohn. Conceivably, P,D, with the help of broad claims in the Δ^1 patents, might be able to challenge Schering's patent claims on prednisilone and pregnisone.

From Syntex's point of view, the license should relieve it of many of the worries it had during last summer's Congressional patent subcommittee investigation (*CW, July 14, p. 20*). At that time Syntex, newly purchased by the Wall Street holding firm, Ogden Corp., was the target of complaints that it was infringing the patents assigned to Parke, Davis by Russell E. Marker, who later helped to establish Syntex. Though P,D was reportedly urged to take action against Syntex, this threat of litigation seems to have been negated by last fortnight's license agreement.

More Action? Syntex, however, isn't completely clear of legal threats. There still remain allegations that the company is persisting in efforts to control supplies of barbasco root, a cheap and plentiful source of diosgenin, basic building block in some hormone derivatives syntheses. In New York, a grand jury convened by a federal judge has subpoenaed records of "companies involved in the Syntex group, and a number of companies with interests in the hormone field," as John Swartz, New York Justice Dept. official, put it. Basically the Justice Dept. is seeking to find out "why American hormone manufacturers can't get into production in Mexico" and whether the activities of Syntex are preventing them from doing so.

Syntex President Licio Lagos and Executive Vice-President Alejandro Zaffaroni unequivocally deny that their company still has firm control over the root supply. They told *CW* that Syntex is in the same position as other companies, has a license to harvest sufficient root for only a few months' operations. The company has applied for license to harvest 2,000 tons—about a year's supply—but received one for less than 1,000. It does, however, have a stockpile of root that was collected well before Mexico relaxed its licensing controls in the face of adverse publicity last summer.

How Much Help? Nonetheless, Mexican sources insist that Syntex, through close friendship between Lagos and Mexican Economics Minister Gilberto Loyo, still has a grip on root supplies, and is aiding the government in delaying issuance of other than temporary harvesting permits.

Syntex had ample opportunity, these sources say, to catch the ear of the Mexican government on a tour of barbasco-producing regions near Oaxaca and Veracruz last July. Syntex officials accompanied Juan Delgado Franco, chief of the government's forestry division on the trip—which they arranged and paid for. Representatives of no other companies were invited to participate.

Reason for the tour: to collect data for an already-lengthy government study of barbasco conservation. This data, and information from a new report said to have been compiled by the company, indicate that the barbasco does not replenish itself for 8-12 years, and that diosgenin yields from secondary barbasco growths are low and of poor quality. Competitive companies, seeking to repudiate such claims, are sponsoring their own report.

Meanwhile, the Mexican government is said to be looking at the feasibility of setting up a district allocation system whereby companies would be alloted districts from which they could harvest the vital root. The allocation of districts would be based on company age, capitalization, production and sales. In this connection, say detractors, the regional trips provided Syntex ample opportunity to point out those regions it would like best; presumably the company's age, capital, production and past sales record would give it first choice.

The Outcome: Contrary to expressed belief that the problem is being eased, the situation looks almost as complex as it has ever been. Though market studies indicate booming potential for steroid makers, the raw material supply problems still portend sticky times ahead.

*These steroids have a double bond (Δ) between carbons 1 and 2 on the basic 4-ring structure of the steroid.

Ahead: Fight To Beef Up Dumping Ban

Battle lines are being drawn for Congressional controversy over present U.S. laws designed to prevent "dumping" of imports on domestic markets at less than fair value.

While various groups — ranging from some segments of the organic chemical industry to producers of cordage fiber and manufacturers of wool goods—have specific complaints with present law provisions, they have one larger complaint—that the law is not being vigorously enforced.

For this they blame the act's administrator, the Treasury Dept.'s Customs Bureau, which, they feel, has used its discretionary powers to effect a weak application of the law. Because of such complaints, Congress—before it adjourned—ordered a report from the Treasury on possible amendments to the act that would make for "greater certainty, speed and efficiency in the enforcement" of antidumping laws.

Such a report, plus amendments already being proposed by interested groups, will certainly bring Congressional hearings.

End to a 'Loophole'? One proposed amendment that has support of some organic chemical firms would substantially change present law. This amendment would do away with the current requirement that there must be injury —real or potential—to a domestic industry before an importer can be restricted.

Other amendments that may be proposed:

- That an importer be required to prove that there had been no injury to domestic industry, rather than have the domestic maker prove that injury had been done.
- That Congress set a definite deadline for action by the Treasury. The most commonly heard time-limit is six months, though a 90-day limit is also possible, if U.S. industry does not have to prove it has been injured.
- That Congress define how closely an import must match a U.S. product for antidumping regulations to go into effect.

CORNING, SYLVANIA OFFICIALS*: In reactor fuels, they see . . .

Reason for Joint Effort

Two major U.S. firms, Sylvania Electric and Corning Glass, last week took the wraps off plans to pool their atomic research efforts. They're forming a joint company to carry out reintensified research and production of atomic fuel elements.

The two firms have been operating independently in this phase of atomic energy for several years, but feel that a joint venture will speed new discoveries in the field and will, in the long run, be more profitable.

As yet, of course, the Sylvania-Corning venture will not include the other half of an atomic fuel "diaper" service—reprocessing of spent fuel elements from a reactor.

Major customer will at first be the Atomic Energy Commission, for the time being the only large-scale user of atomic fuel elements. However, the companies say that it won't be long before industrial firms with nuclear reactors will substantially expand the market.

Details of cost, location and capacities of a new plant are yet to be firmed up, but the site has been narrowed down to the "Northeast"—probably New York state. Plant cost will be in the multimillion-dollar range.

*Corning Chairman Amory Houghton, Sylvania Chairman and President Donald Mitchell, Corning President William Decker, shown with reactor fuel element.

Most of Sylvania's fuel element efforts have been channeled into developing metals and alloys that could stand the tremendous temperatures generated by a reactor and still satisfy necessary radiation specifications.

Corning has researched along much the same lines, but with emphasis on ceramic coatings instead of metals.

Both types of materials can be used in fuel slugs themselves or in coatings for fuel—but ceramic coated materials may have a slight edge as probable favorite of future consumers. Reason: they can withstand much higher temperatures than any alloys developed so far. Too, basic material is substantially cheaper.

On the other hand, metallic alloys will stand thermal shock—the sudden heating or cooling of a reactor—that might cause ceramic materials to crack. And metals conduct heat more efficiently and can be easily fabricated into desired oblong-shape elements.

Right now, each type has its place in the scheme of atomic research, and the decision to join forces should mean faster development of satisfactory elements for reactors that will operate over different temperature ranges. Perhaps, too, the Sylvania-Corning joint operation will influence other chemical process companies with interest in atomic energy to take a closer look at similar joint-effort possibilities.

DIXON'S Bay, Dixon, Newark Mayor Carlin open plant, moving Dixon . . .

From Seller to Maker

Can a small new firm compete with long-established companies in the basic chemicals business? Dixon Chemical and Research Inc. believes so—and it's already poised to make a serious bid for established markets.

The company, formerly a $2-million/year chemical distributor headquartered in Clifton, N.J., has just opened a new sulfuric plant in Newark, N.J., termed by a company official as "probably the biggest contact acid unit in the U.S.—and maybe in the world."

The $2.5-million plant is rated at 400 tons/day but is reportedly capable of turning out much more. One estimate puts the maximum close to 600 tons.

Though the company will be bucking big-league competition from such sulfuric makers as Monsanto, Allied and Olin Mathieson, President Arthur Dixon thinks his company is well entrenched and set up to grow rapidly. "We've already sold 85% of our output for next year," he asserts. "And right now we're negotiating with a major chemical company on a $4.5-million joint venture. It should be firmed up very soon."

Big reason for Dixon's decision to venture into basics was the need for a sulfuric plant in the Newark area. Dixon cites a survey of 50 major consumers in and around Newark that revealed that 397,000 tons/year of sulfuric were being shipped in from distant plants. By having a unit right there, Dixon can minimize freight costs.

The firm can make shipments by tank truck, tank car and barge—and with its deep-water docks, reports Sales Vice-President Louis Bay, it could even make deliveries via ocean-going ships.

Another Advantage: Dixon counts on being able to get raw material at lower-than-usual prices. The company is buying sulfur from a Mexican firm anxious to establish itself in the U.S. and willing to sell at attractive prices to do it.

Another factor influencing the move is the company's philosophy of getting into a business that already has a large market. "This idea of educating the public to some new specialty or product can be expensive," says 36-year-old Dixon.

Other expansions are now on the drawing boards. Though most details are still under wraps, the company reported it will build a 60-ton/day ammonium sulfate unit and a new office building in Newark. It will float a new stock issue, probably convertible preferred, to finance these projects.

Dixon, who wasn't taken very seriously by potential competitors when he announced his plans last year, has made good on all his promises so far —and if the company continues to grow at its present rate, Dixon Chemical and Research will soon be a potent factor in markets that used to be considered "sewed up" by the larger producers.

Bar to Barging?

Stoppage of barge transportation on the upper Mississippi River is again a problem of real concern.

Though rains that fell early this month postponed any shutdown (*CW Business Newsletter, Nov. 3*), the threat is again being raised. If the Mississippi and Missouri valleys don't get more rain, the water level may reach a record low by Dec. 15.

Since the start of November, the U.S. Corps of Engineers has been gradually drawing down water from 26 reserve areas above the Alton, Ill., locks—keeping a minimum 7-ft. level at the Alton navigation locks. Such a level (*CW, Oct. 20, p. 23*) allows barges loaded two-thirds to three-quarters of capacity to pass through the locks on their way to Minnesota's Twin Cities and to the Chicago area.

What Next? An emergency diversion of water from Lake Michigan has now been proposed as perhaps the only way to keep Mississippi-Chicago traffic moving. Proposal for such a diversion is currently before the U.S. Supreme Court. If the court grants the petition following a hearing this Thursday, the current 1,500 cu. ft./second of water that now flows from Lake Michigan would be increased to 11,500 cu. ft. Such a diversion, according to the petition, could continue for a maximum of 100 days.

Chemical Impact: What has the low river level meant to chemical shipments? These are typical:

- Federal Barge Lines, with about one-fourth of its cargoes consisting of dry sulfur and chemical products, halted operations to the Twin Cities a month earlier than last year. Though it will try to continue to ship to Chicago, it has doubts about how long such barging can continue.
- Lake Tankers Corp. estimates that its operations have been reduced in efficiency by about 20% during the past month.

Washington Angles »

» **Does your company have drug-marketing** problems overseas? If so, the Food & Drug Administration would like to know about them. Next month, FDA Commissioner George Larrick will attend an international Geneva meeting of drug control officials, and he wants to hear from firms that have suggestions on how various countries might improve administration of their drug laws.

» **Chemical makers** watching federal road-building plans (CW, July 14, p. 22) can expect those programs to come up for lengthy discussion over the next few years. Government officials are already looking askance at over-all cost estimates. They're concerned that the program may become more costly if construction and material costs continue to rise.

The Bureau of Public Roads reported last week that the price level for highway construction rose to a new high in the last quarter, 3.8% higher than in the second quarter. It was the fifth consecutive quarter in which such costs have moved higher.

» **Defense contractors need better guidance** from the Pentagon than they've been getting so far on the amount of classified data they should give out to trade and technical journals. This view was expressed in a report by the advisory committee Defense Secy. Charles Wilson set up to look into the department's security classification system. The committee, headed by former Assistant Defense Secy. Charles Coolidge, found the system "sound in concept" but "not operating satisfactorily in some respects." The report was made public by a House Government Operations subcommittee under Rep. John Moss (D., Calif.) in resumed hearings into criticism that Pentagon security policies make it hard for scientists to exchange data needed for weapons development.

» **Justice Dept. Antitrust Chief Victor Hansen** says the Eisenhower Administration will again ask Congress to tighten the antitrust laws. Hansen, plumping for the same tough amendments backed by the Administration in the last session of Congress, puts major emphasis on changes in the antimerger law.

Two of his proposals passed the House of Representatives, but stalled in the Senate last summer. One is premerger notification, to require big corporations to give antitrusters advance notice of plans to merge. The other measure would plug an existing "loophole" on bank mergers by making bank asset acquisitions—not now covered—subject to the law. A third proposal—on which the 84th Congress took no action at all—would give the Attorney General new authority to subpoena company files to make antitrust investigations.

COMPANIES

Reichhold Chemicals offering of 200,000 shares of common stock, the company's first to the public, was oversubscribed. Price: $22.50 per share.

•

Visking Corp. shareholders will meet Dec. 19 to vote on a proposal to sell the firm's assets to Union Carbide and Carbon Corp. Terms of the transaction include the exchange of one share of UCC for each 2½ shares of Visking held.

•

Stock of American Petrofina, Inc., which recently merged with Panhandle Oil Corp., has been made available to participating preferred shareholders of Canadian Petrofina Ltd. A total of 999,093 Class A shares of American have been offered at $11/share.

•

Warner-Lambert Pharmaceutical will purchase the capital stock of Nepera Chemical Co. and its subsidiaries. Terms include an exchange of 178,079 shares of Warner-Lambert common and 70,702 shares of its $100-par $4.50 cumulative preferred for all the capital stock of Nepera and its subsidiary, Anahist, and for a 75% interest in Nepera International. At current market prices, this Warner-Lambert stock is worth about $15 million.

EXPANSION

Tin Chemicals: Metal & Thermit Corp. has bought a 163-acre tract near Carrollton, Ky., on which it will build an organo-tin chemicals producing plant to supply stabilizers for plastics manufacturing.

•

Butadiene: Polymer Corp., a Crown-owned corporation, has taken up its option on 1,100 acres near Red Deer, Alta. The company plans to build a $5-million butadiene plant utilizing raw materials supplied by a nearby British American Oil Co. refinery.

•

Sulfur: Laurentide Chemical & Sulphur Co. is building a $1.25-million, 33,000-long-tons/year sulfur recovery plant at Montreal East, Que. The plant will recover sulfur from hydrogen sulfide gases supplied by petroleum refiners in the area.

•

Fiberglass: Fiberglas Canada, Ltd., expects to build a $1-2-million glass fiber production plant in western Canada in the next two years. Likely locations: southern Alberta or Manitoba.

•

Oxygen: Linde Air Products Co., division of Union Carbide, will double its oxygen capacity at Belle, W. Va.

FOREIGN

Electrochemicals/India: Indian Electro Chemicals Ltd., a recently formed company with capital authorization of $1.05 million, will build an electrochemical plant in the state of Bombay. Products: sodium hydrosulfite (1,500 tons/year), liquid sulfur dioxide (2,000 tons/year) and hydrogen peroxide (700 tons/year). Cost of the plant: $1 million.

Choose the Right Size of PARADI®

from this time-saving checklist

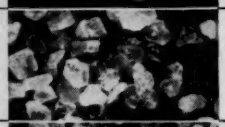
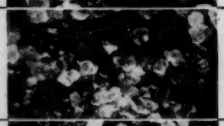
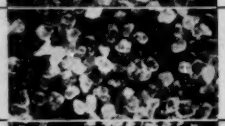
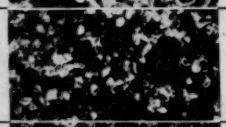
This checklist shows the many forms in which you can purchase PARADI (100% pure Hooker paradichlorobenzene).

Every one of the six crystal sizes has its advantages, depending on how you plan to process or repackage it. All six are shown here actual size.

To help square away your paradichlorobenzene requirements for this year, just route this page to the right people in your company. We've left space for their comments.

✓ PLEASE ROUTE TO:

- ☐ *Purchasing*
- ☐ *Production*
- ☐ *Sales*
- ☐ *Research*
- ☐ *Return to Purchasing*

SIZE AND DESCRIPTION:	COMMENTS:	CHECK HERE FOR: Free 1-lb. sample	50-lb. trial drum (purchase)	Further information
PEA No. 1 Repackage these big sparkling PARADI crystals just as they come from the drum.				
PEA No. 2 A popular size for repackaging in vaporizer cans. 				
RICE No. 1 Smallest crystals recommended for direct repackaging. Excellent for shaker-top cans. 				
RICE No. 2 Exceptionally free-flowing, easy packing, for fast refilling of power presses. 				
RICE No. 3 For foot-operated presses you need a finer crystal like this—free-flowing but small enough to pack and compress easily. 				
POWDERED Save time in melting and molding with this super-fine fast-melting size.				

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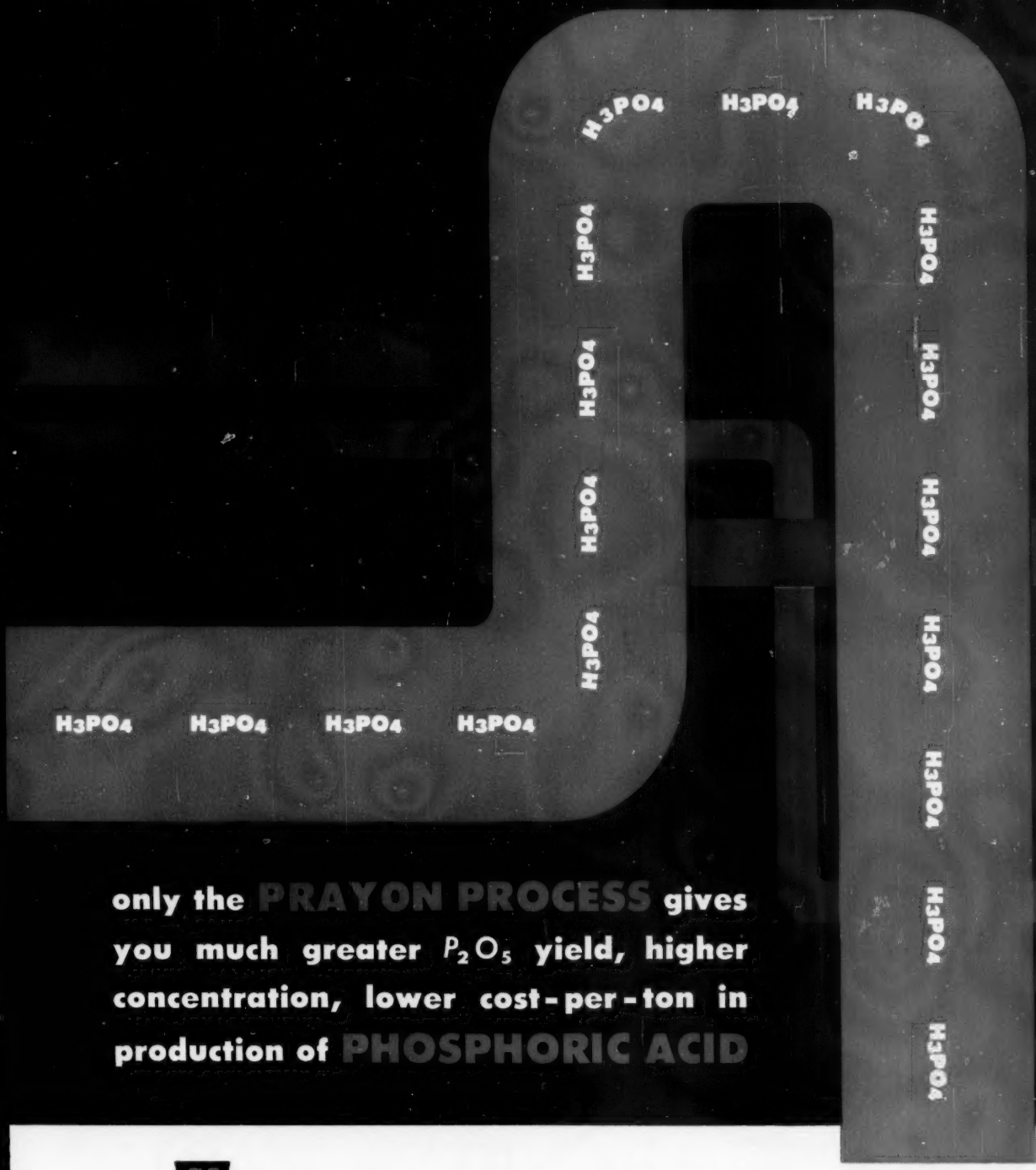

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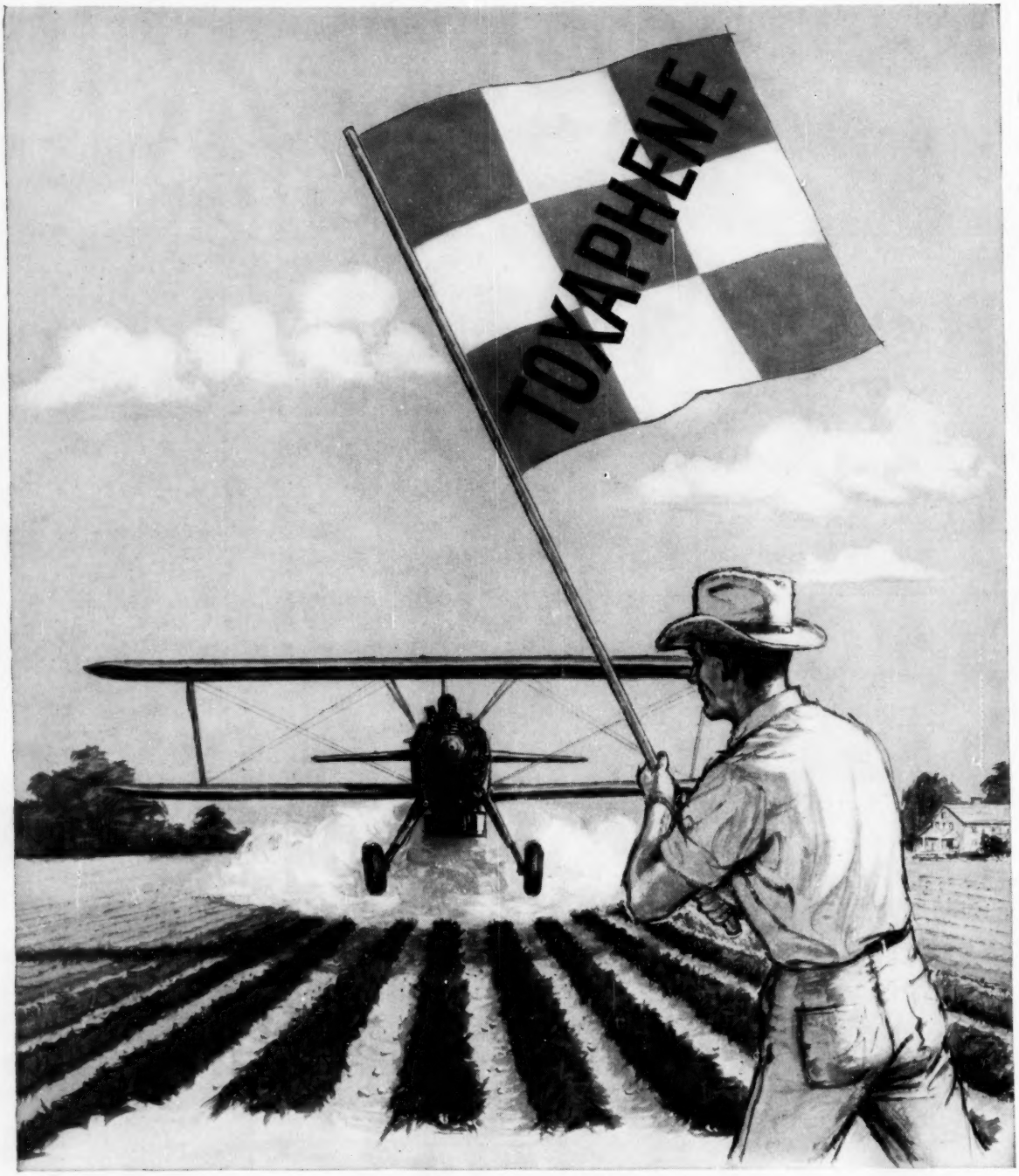

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NX 56-11

MONTREAL AS CHEMICAL CENTER: In old district near Lachine Canal, industry is served by sea-going freighters.

'Old World' Site Is New Chemical Hot Spot

Twelfth-generation French-Canadians—direct descendants of the French colonists who founded Montreal and lesser communities nearby more than 300 years ago—are selling their small farms along the St. Lawrence River and going to work in the industrial plants being built on the old croplands, where chemical companies are taking the lead in setting up shop.

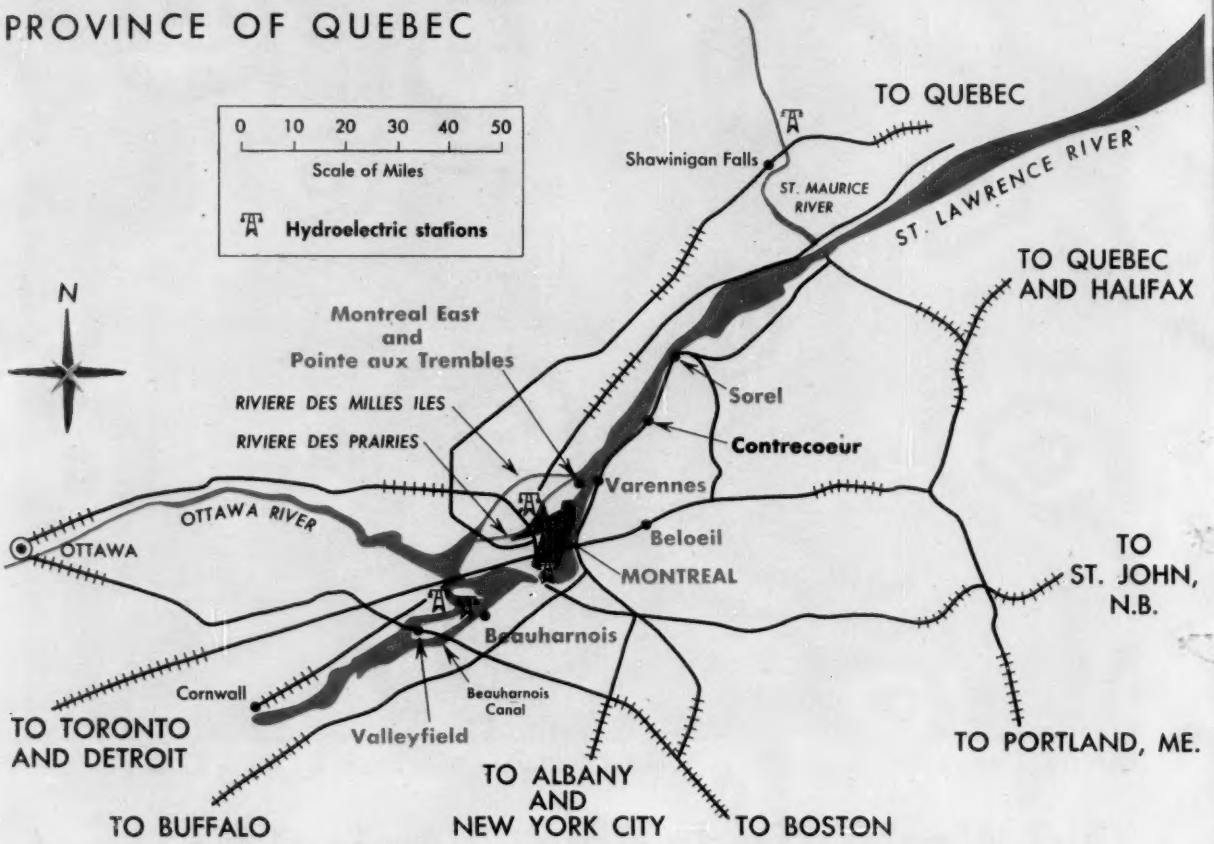
Hard economic reasons are behind industry's current move into the historic 80-mile stretch from Valleyfield to Sorel (*see map, p. 30*) in which Montreal (population 1.1 million) is the big metropolis. Among the attractions:

• Giant new Canadian mining ventures, some of which will likely lead to processing of ores and possibly fabrication of finished products in the Montreal vicinity.

Story continued on p. 32

NEW INDUSTRIAL TOWN: In St. Laurent, pharmaceutical headquarters.

NEW CHEMICAL SITES ALONG



	Company	Principal products	Abuilding	Operating	Expanding
AT MONTREAL EAST AND POINTE AUX TREMBLES	B.A.-Shawinigan Ltd., subsidiary of British-American Oil Co. Ltd. and Shawinigan Water & Power Co.	Phenol, acetone		√	√
	Canada Cement Co. Ltd.	Portland cement		√	
	Canada Metal Co. Ltd.	Nonferrous metals		√	
	Canadian Copper Refiners Ltd.	Copper		√	
	Carbide Chemicals Co., division of Union Carbide Canada Ltd.	Ethylene glycol, polyethylene		√	√
	Shell Oil Co. of Canada	Petrochemicals		√	√
AT BELOEIL AND McMASTERVILLE	Canadian Industries Ltd.	Explosives, fertilizers		√	
AT SOREL	Quebec Iron & Titanium Corp.	Titanium		√	

CANADA'S SEAWAY

	Company	Principal products	Abuilding	Operating	Expanding
AT VARENNES	Canadian Titanium Pigments Ltd., subsidiary of National Lead Co.	Titanium pigments	√		
	Electric Reduction Co. Ltd.	Phosphates		√	
	St. Maurice Chemicals, Ltd., joint subsidiary of Shawinigan Chemicals, Ltd., and Heyden Chemical Corp.	Formaldehyde, pentaerythritol		√	√
AT VALLEYFIELD	Davison Chemical Co., division of W. R. Grace & Co.	Catalysts	√		
	Merck & Co. Ltd., subsidiary of Merck & Co.	Fine chemicals, pharmaceuticals, feed mixtures		√	√
	National Silicates Ltd.	Sodium silicates	√		
	Nichols Chemical Co. Ltd.	Sulfuric and hydrofluoric acids		√	√
	Sturge (Canada) Ltd., joint subsidiary of Merck (U.S.) and Sturge (England)	Citric acid		√	
AT BEAUHARNOIS	Aluminum Co. of Canada, subsidiary of Aluminium Ltd.	Primary aluminum		√	
	Electro Metallurgical Co., division of Union Carbide Canada Ltd.	Ferroalloys		√	
	Electro-Reagents (Quebec), Ltd.	Ferroalloys		√	
	Howard Smith Paper Mills Ltd.	Paper		√	
	Standard Chemical Ltd.	Chlorine, caustic soda		√	
AT MONTREAL	Abbott Laboratories Ltd., subsidiary of Abbott Laboratories	Pharmaceuticals		√	
	Ayerst, McKenna & Harrison, Ltd.	Pharmaceuticals		√	
	Canadian Industries Ltd., subsidiary of Imperial Chemical Industries Ltd.	Paints, fertilizers		√	
	Charles E. Frosst & Co.	Pharmaceuticals		√	
	Industrial Grain Products Ltd.	Monosodium glutamate		√	
	Linde Air Products Co., division of Union Carbide Canada Ltd.	Acetylene, oxygen		√	
	Monsanto Canada Ltd., subsidiary of Monsanto Chemical Co.	Polystyrene, oil additives		√	√
	Sherwin-Williams Co. of Canada Ltd., subsidiary of Sherwin-Williams Co.	Paints		√	
	Smith, Kline & French Inter-American Corp., subsidiary of Smith, Kline & French Laboratories	Pharmaceuticals		√	

• Canada's rapidly growing industrial market, for which Montreal is the principal transportation and distribution center. (Gross value of Canada's 1956 manufacturing output is expected to be about $20 billion, a more-than-100% increase since 1946.)

• Money-saving water transportation, with ocean-going freighters now serving the port of Montreal eight months of the year, and Great Lakes steamers due to extend their runs to this port as soon as the St. Lawrence Seaway is completed.

• Plenty of low-cost electric power from the Quebec Hydro-Electric Commission's grid, to which new generating stations are being added under a $500-million, six-year expansion plan.

• Ready availability of plant sites, manpower, and numerous raw materials—including timber, agricultural and fishery products, and minerals—possibly including petroleum.

Spurred by Industrial Buildup: Montreal has always been reachable by sea-going ships, and harnessing of the area's hydroelectric power potential dates back to more than 30 years ago. So it's the recent, fast-breaking development of Canada's mining and manufacturing industries—both as actual and prospective large-scale producers and consumers of chemical products in and through the Montreal business and communications center—that has spurred current chemical industry interest in this region.

To understand this industrial trend, it's helpful to run through the chemical expansion projects in the area. New plants will produce catalysts, sodium silicates, titanium pigments, and also these items not listed on the preceding pages: sulfur (from petroleum gases) by Laurentide Chemical & Sulphur Co. at Montreal East; edible oils by Procter & Gamble Co. of Canada Ltd. and pharmaceuticals by Nordic Biochemicals Ltd., both in Montreal. Additions to existing plants will bring production of polyethylene resins, ethylene oxide derivatives, detergent alkylate (dodecyl benzene), hydrofluoric acid, and certain oil additives. Many of these products have never before been made in Canada; and nearly all of them will pass through other chemical process plants before going to consumers.

Thus, a picture evolves of this area's economic future as Canada's great processing center. Reinforcing this vision are various not-yet-definite plant projects: Shawinigan Chemicals owns considerable land adjacent to the St. Maurice Chemicals works near Varennes, has openly toyed with the idea of going into new production there; newly organized Quebec Ammonia Co. Ltd. owns land next to where the Canadian Titanium Pigments plant is abuilding, but may decide instead to locate near Maitland, Ont.; and there have been persistent rumors that a major steel mill, iron ore beneficiating plant, and cement plant are coming to south-shore sites between Varennes and Contrecoeur.

Complicating Factors: Complications—not necessarily drawbacks—involved in doing business in Montreal and vicinity include shipping limitations, "double taxation," and a labor force that's largely made up of people whose customs and traditions are distinctly different from those prevailing in New Jersey or Texas.

The Port of Montreal—where a major improvement project is now under way—is cut off from shipping each winter.

Paying income tax to both state and federal governments is the usual thing in the U.S.; but in Canada, Quebec is the only province imposing its own income tax—7% of net taxable income earned within the province. A credit for that amount may be claimed against the federal tax, but the provincial tax doubles the volume of paper work for tax purposes.

Time was when Montreal was apprehensive that it would lose its position as Canada's chief inland port after the Seaway is built. But economic studies repeatedly have shown that much of the cargo volume is consigned to, or originating from, Montreal itself, so the community has jettisoned its worries. In fact, the Seaway is bound to help Montreal and vicinity in at least two ways: it will bring more hydro power, and it will enable the larger vessels in Great Lakes traffic to come to Montreal. So this community is girding for more industrial and transportation business than ever, anticipating the role of "the Delaware of the future."

COMING VIA SEAWAY: With 27-ft. channel dredging, large freighters on Great Lakes will be able to reach Montreal.

Keeping the business end of a hull in business!

Every craft, from a roaring speedboat to the lazy family canoe, is only as seaworthy as the thin "skin" of finish that shields it. And this vital "skin" has to be tough to provide active protection from water, wind, weather!

Superior resins produced through the use of Olefins are greatly responsible for modern rugged finishes. Olefins are members of Atlantic's petrochemical family; that's why you see the oil refinery in the picture.

Olefins are used in production of quality resins for heavy-duty varnishes. They offer faster drying, increased durability against wear and erosion. Typical applications of resins include industrial flooring, bowling alleys, boats. Olefins are also being used profitably in the manufacture of rubber chemicals, germicides, insecticides, dyes and surface active agents.

Your own business may have use for these or any one of a wide variety of Atlantic petrochemicals. Our sales engineers will gladly work with you in putting any of these chemicals to work in order to improve your present product, develop new products or to speed production—with cost-cutting savings as the result.

For full information, write or wire The Atlantic Refining Company, Dept. H-11, at the nearest office listed.

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ATLANTIC
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CHEMICALS

No Letup on 'Ads'

There's no letup in the Federal Trade Commission's vigilance against what it considers false and misleading advertising. Latest developments: cease-and-desist orders against Carter Products, Inc. (New York), and Kedvale Pharmacal Co. (Chicago).

In March '51, the commission first issued a cease-and-desist order against advertising practices used in connection with Carter's Little Liver Pills. The Ninth Circuit Court, on review, said Carter had been denied a fair hearing by the examiner who restricted the company's right to cross-examine three of the government's expert witnesses. The Supreme Court then granted certiorari, remanding the cause to the U.S. Court of Appeals with directions to authorize FTC to open the proceedings for further evidence and a new order consistent with the Court of Appeals opinion.

A second FTC action has resulted in orders for Carter to stop using the word "liver" in the tradename of the laxative preparation designated as Carter's Little Liver Pills, and from claiming curative or natural powers for the pills.

In a third litigation, FTC has ordered Kedvale to stop advertising its drug product, designated as Sanforin, as a new discovery and an effective treatment and cure for all kinds of arthritis, rheumatism and similar ailments, and the symptoms and pains thereof.

LEGAL

Ball Applicator Suit: Bristol-Myers Products Division of Bristol-Myers Co. (New York) has settled out of court its patent infringement suit against Carter Products, Inc. (New York). The settlement—made by consent of both parties—includes an injunction to prevent Carter from using Bristol-Myers' U.S. patent 2,749,566 covering a ball applicator used in B-M's deodorant lotion, Ban.

Carter—which was charged with infringing the patent with the introduction of its Whirl-in Arrid applicator—says it will stay in the ball applicator field. The settlement—which involved no damages—and the injunction will have no effect on commercial plans, a company spokesman said. Bristol-Myers, headed by President Lee Bristol, told *CW* that there has been no mention of a licensing agreement permitting Carter to use the patent.

JEAN RAEBURN

BRISTOL: In consent settlement, an injunction and no license.

LABOR

The 30-Hour Week: While still displaying signs of internal disunity—e.g., the recent international affairs committee hassle that saw the resignation of Jacob Potofsky as cochairman—AFL-CIO is solidly united behind the proposal for a 30-hour week with no cut in take-home pay.

In the fore of the shorter-hours movement is Oil, Chemical & Atomic Workers Union, whose research and education department has just released a timetable for developments in this field.

Predicting that the 30-hour week will apply throughout most of the economy by 1970, the union, in its publication *Facts & Trends,* says its blueprint shows a "gradual reduction of working hours can take place and, at the same time, weekly earnings can increase." By the time the 30-hour week is reached under this scheme, OCAW says, weekly earnings will be up $16.05 in chemicals. The plan calls for $3.05 average hourly earnings in 1970, with weekly earnings at $94.55 for 30 hours of work.

Meanwhile, OCAW's Canadian Council is setting a goal of "substantial increases" from the Canadian chemical industry in 1957.

Industry-wide committees for chemical, petroleum and utilities were established at a recent meeting, and chemical representatives went on record for elimination of wage inequities within bargaining units, between plants of the same company, and within the industry. The bargaining policy also calls for shift differentials of 15¢ and 20¢ double time for all overtime, and premium pay for regular Sunday work for shift workers.

•

Phosphates and Health Benefits: Recent major developments in occupational health and prepaid medical insurance represent further evidence of union plans for determined drives in these areas.

International Chemical Workers Union (AFL-CIO) has asked U.S. Public Health Service to investigate health conditions in the Florida phosphate industry. ICWU hopes that a thorough study will lead to "greatly improved conditions."

Calling for more-widespread prepaid medical insurance, United Automobile Workers President Walter Reuther told an organizational meeting of the Community Health Assn. in Detroit: "The purpose of the association is to develop a program to make it possible for individuals and families in the community to purchase comprehensive medical care of high quality through prepayment."

Reuther announced a plan that, he said, would offer more coverage for more money. "We must broaden participation," he declared, "because our idea is not to supplement any existing prepaid health program, but rather to form an entirely new one."

KEY CHANGES

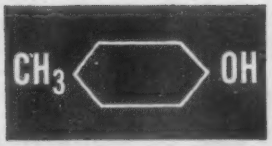
Murray C. McNeil, to vice-president and general manager, Southern California Fertilizer Co. (Los Angeles).

E. L. Lamb, to vice-president in charge of planning and development, Minnesota and Ontario Paper Co. (Minneapolis).

Roy Titus, to board chairman, Helena Rubinstein, Inc. (New York).

George C. Ellis, to director and senior vice-president, Stauffer Chemical Co. (New York); and general manager, Stauffer's West End Chemical Co. Division.

Charles H. Kline, to scientific director, Shulton, Inc. (New York).



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The availability of PARA-CRESOL, in commercial quantities at economical cost, offers many possibilities for improvement in costs or methods. These are suggested in the new Sherwin-Williams PARA-CRESOL Technical Bulletin just published. Write for your copy containing specifications, properties, toxicity, typical reactions and uses.

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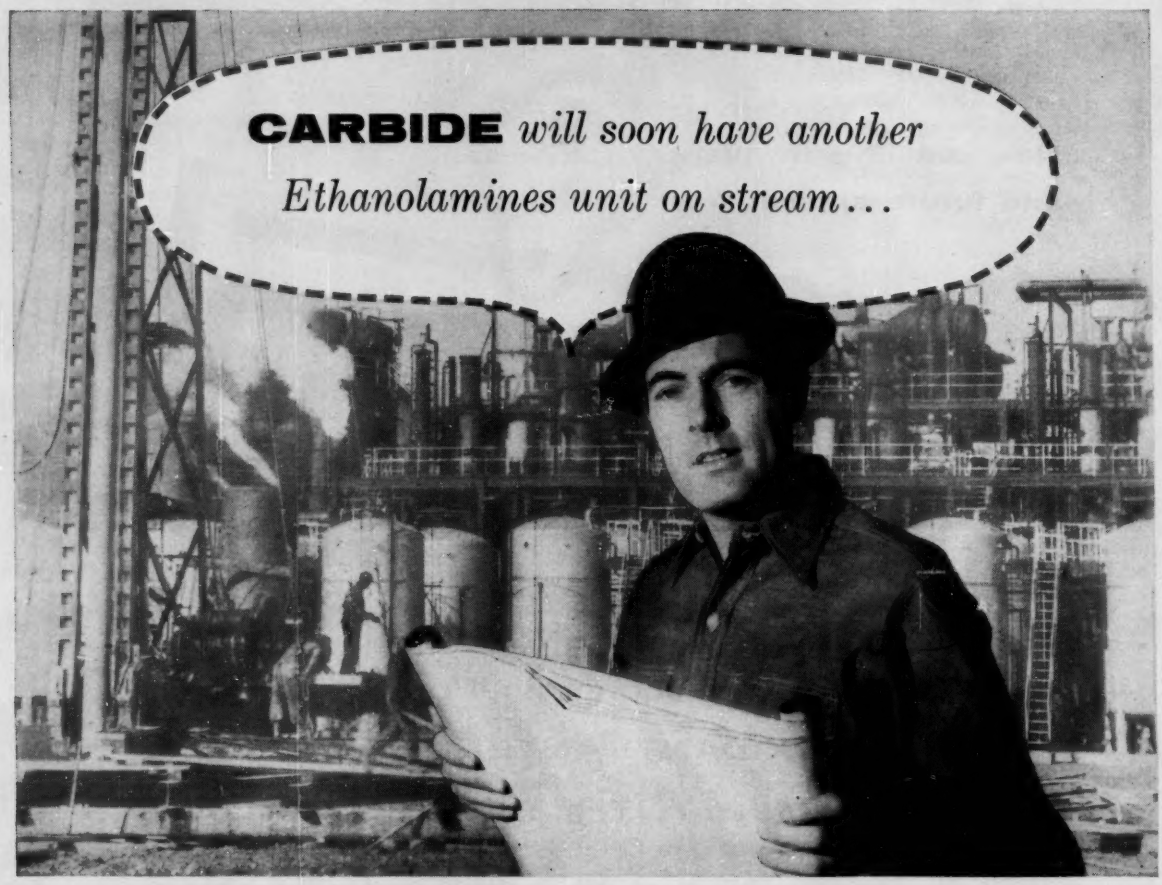

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CARBIDE'S Seadrift, Texas plant will soon be pouring out ethanolamines to meet growing needs for acid gas absorbents and vital components of soluble oils, detergents, and soaps. This means that there will be two plants—South Charleston, West Virginia and Seadrift—supplying you with ethanolamines.

You can share in this increased availability by checking with your CARBIDE Technical Representative now.

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- You receive immediate delivery of mono-, di-, or triethanolamine—in the size shipment you need from the CARBIDE warehouse in your area.
- You profit through complete technical help from the world's first—and leading—producer of ethanolamines.
- You don't have to worry about continuous supply—especially with CARBIDE'S plants drawing on a constant source of raw materials.

Write today for your copy of the booklet "Nitrogen Compounds," which discusses applications, physical properties, and specifications for CARBIDE'S ethanolamines. Address—Carbide and Carbon Chemicals Company, Room 308, Dept. H, 30 East 42nd Street, New York 17, New York.

In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal.

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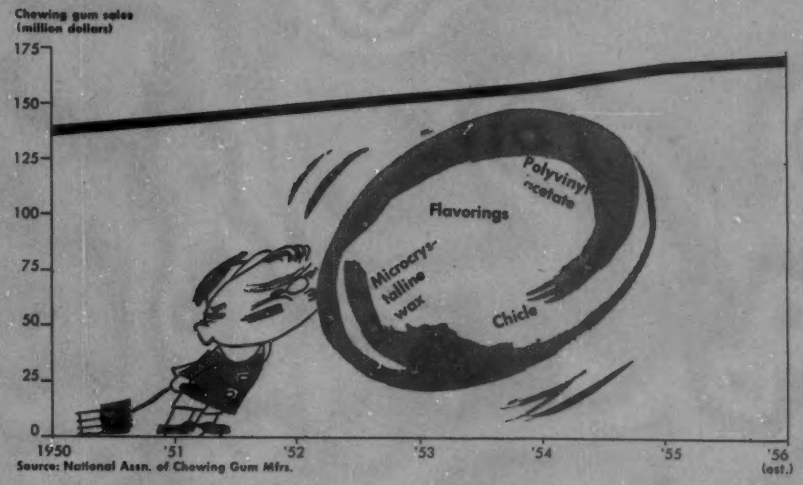
Charting Business

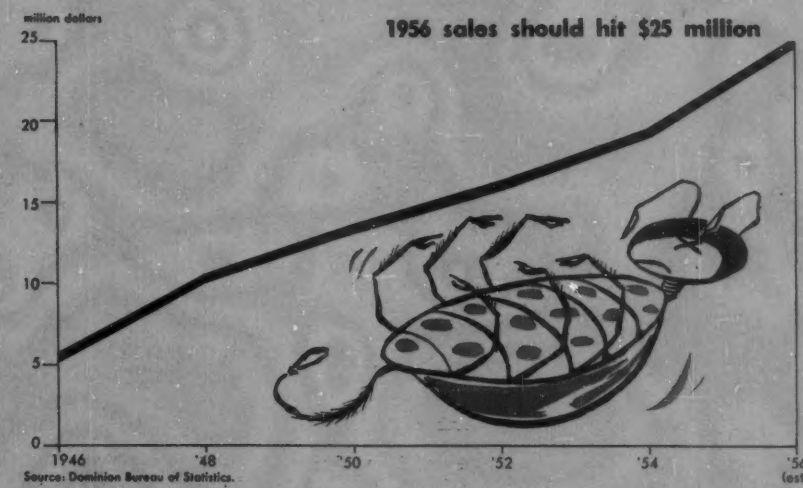
CHEMICAL WEEK
November 24, 1956

Chewing Gum Takes a Mouthful of Chemicals



GUM CHEWING, a standard U.S. pastime, is still going strong. Sales of chewing gum this year are expected to reach an all-time high of $165 million—a 21% jump over sales in 1950. And this means more money for chemical producers. This year, gum chewers are expected to consume about 4,000 tons of polyvinyl acetate, more than 2,000 tons of microcrystalline wax, 10,000 tons of natural gums (mostly chicle) and 9,000 tons of flavors.

Canadian Pesticide Sales Jump 400% in a Decade



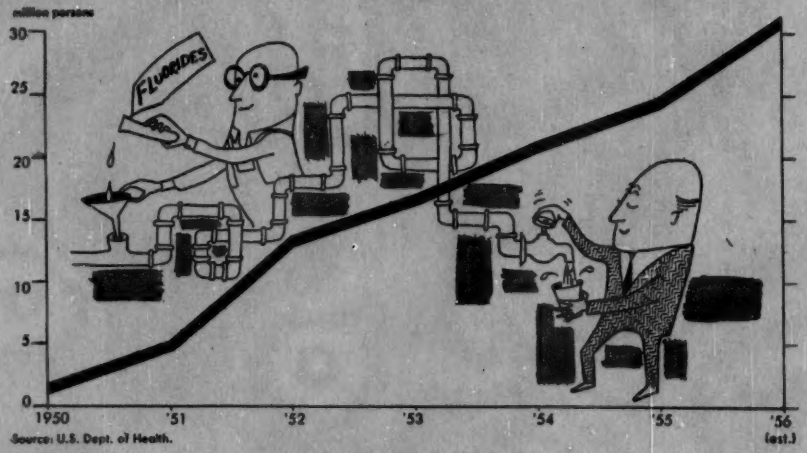
CANADIAN pesticide sales have had such a phenomenal growth in the last 10 years that they are expected to hit a peak of $25 million this year—about $2 million more than in '55. Agricultural dusts and sprays account for the largest share ($8.1 million); herbicides and animal treatment products will be close behind ($6 million and $5.2 million, respectively). Total pesticide sales forecast for '61: about $48 million—a 92% jump over '56 sales. Agricultural needs should add up to approximately $38.7 million in sales.

Charting Business

(Continued)

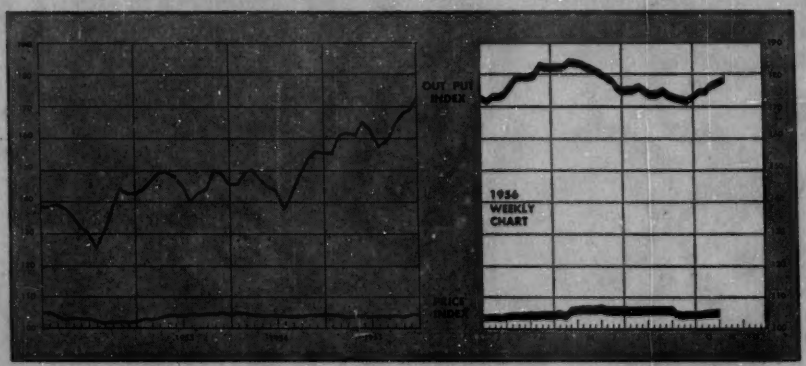
MORE FLUORIDATED WATER FLOWS

Today, over 30 million people drink it



NEARLY 1,500 towns and cities with a total population of about 31 million will be using fluoridated water by the end of this year. This compares with only 94 communities with population of about 1.5 million using fluoride-treated water in '50. To treat such large amounts of water, these estimated amounts of fluorine-containing chemicals will be used in '56: 7,000 tons each of fluorosilicic acid and sodium silicofluoride; 2,000 tons of sodium fluoride; 750 tons of ammonium fluorosilicate.

BUSINESS INDICATORS



WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	182.8	182.6	168.3
Chemical Week Wholesale Price Index (1947-49=100)	106.6	106.5	104.7
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	429.4	444.6	494.8

MONTHLY Wholesale Prices (Index 1947-49=100)	Latest Month	Preceding Month	Year Ago
All Commodities (other than Farm and Foods)	115.5	115.5	119.0
Chemicals and Allied Products	107.7	107.1	106.5
Industrial Chemicals	122.6	121.9	118.9

Superior qualities of gloss... non-scuff... non-slip wear and water-resistance... leveling and stability

Wax, and only wax, gives the outstanding characteristics demanded by the polish buying consumer. As one expert has phrased it—"you can get out of a polish only what the wax has put in." Warwick, the world's largest specialty wax refiner, offers a variety of products (oxydized waxes—Cardis One, Cardis 314, 319, 320; Cardis Polymer 8; Cane Waxes 500 and 700) and a variety of expert services (basic formulations for all types of polishes for home and industry). Warwick's stock and service centers in principal cities and custom blending of waxes and resins also provide polish manufacturers with maximum performance *at no premium charge for the highest quality.*

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Complete Line of detergent chemicals to choose from:

Assured Supply because Monsanto is the world's largest producer of elemental phosphorus.

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One group of people serves you. Salesmen and warehousemen work together on your order as a single co-ordinated team.

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Here is a product listing for your file:

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Dodecylbenzene Sulfonic Acid

PHOSPHATE SALTS

Monosodium Phosphate
Disodium Phosphate
Trisodium Phosphate
Tetrasodium Pyrophosphate
Sodium Tripolyphosphate
Sodium Acid Pyrophosphate
Tetrapotassium Pyrophosphate
Monopotassium Phosphate
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Each developed for specialized applications

Anionic (Alkyl aryl sulfonates)

Santomerse No. 1
Santomerse 80
Santomerse S
Santomerse SX
Santomerse 3 Paste
Santomerse E

Nonionic (Polyoxyethylene esters, ethers and thioethers)

Sterox CD
Sterox AJ
Sterox SK
Sterox 6

BUILT DETERGENTS

Sterox AWS
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why Monsanto for detergent chemicals

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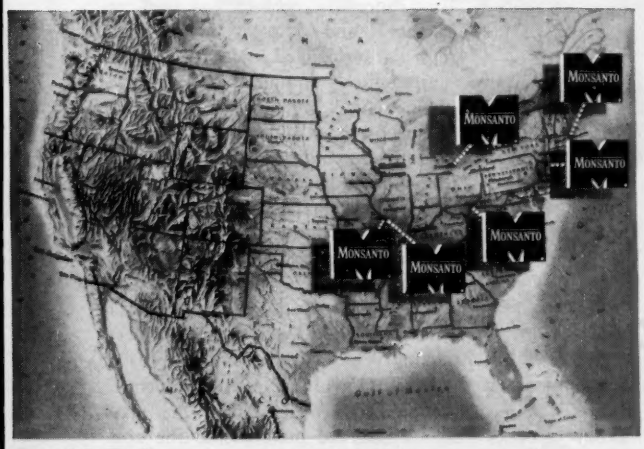

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Vying for Solder's Jobs

There's plenty of potential—that much is agreed upon. But there's not such unanimity about just how the products should be sold, and whether present ones are fully capable of fulfilling their promise. The products in question are plastic "cold solders," organic resin compounds for metal-work and repair, and their burgeoning interest to specialties makers was emphasized recently by a new product out of Permacel Tape Corp. (New Brunswick, N.J.).

Permacel's entry is an autobody patching kit—resin, catalyst, and glass-cloth—designed for repairing both plastic- and steel-bodied automobiles. It's not the first kit of this sort, and its significance lies less in novelty than in the fact that still another large firm sees a big future for plastics in metalworking and repair.

Slumbering Giant? There's no question, on the other hand, that the "solders" have not yet worked up giant volume sales. The handful of firms currently in the business are estimated to be doing total business in the $500,000-plus range now—and that includes both metal-filled and glass fiber-reinforced materials, sold for both industrial and household use.

The descriptive phrase, "metal-filled and glass fiber-reinforced," points up the inadequacy of the term "solder." It hints, too, of the great versatility of these resin repair-agents that are useful not only with metals, but also with ceramics, glass, plastics. It's this versatility, as much as anything else, that has specialties makers charting vast potentials.

Classification: These resin materials take several forms. Most closely related to the familiar soft-metal compounds are the products made of resin and powdered metal. Best known of these (a piece in *Life* magazine was a big help to fame) is probably Devcon Plastic Steel (Chemical Development Corp., Danvers, Mass.). It contains 80% ground metal in 20% resin. Besides its plastic steel, Devcon has aluminum-containing material (one form specially created for heat resistance), and indicates that it could offer the resin filled with virtually any desired metal (stainless steel, bronze, etc.).

Devcon hasn't the field to itself. Among competitors: Bonded Products Co. (Chicago), selling Epi-Seal; Borden Co. (which sells its own product, Resmetal, manufactures for others, also offers resins filled with a variety of metal powders); Furane Plastics, Inc. (Los Angeles), with its Epocast 152; Rezolin, Inc. (Los Angeles), making XLC-200.

Fiber Favored: Most influential among those firms selling the glass fiber-reinforced materials to the consumer is General Motors, which got into the business because it had an automobile that required it—the Chevrolet Corvette.

GM at first favored a polyester

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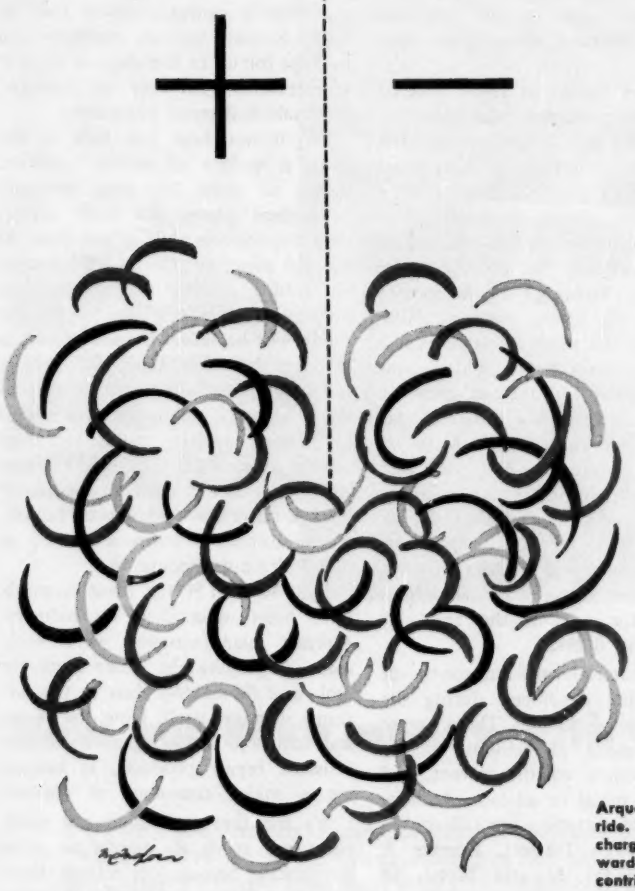
now available to meet growing demand



You can get in on tremendous new profits in these tremendous markets—households, hotels, hospitals, laundries. All because the demand for Arquad 2HT can now be met by the new McCook plant.

Fabric softeners based on Arquad 2HT compete with nothing you're now making. No soap, no detergent, no water softener can do what Arquad 2HT does!

Softens all fabrics • takes scratchiness out of starched shirts • makes towels twice as fluffy • helps fabrics resist dirt • makes clothes dry faster • makes ironing easier.

Softeners based on Arquad 2HT are easy to manufacture, easy to sell, easy to use—and the market has hardly been scratched!

Send for a free sample of Arquad 2HT and information on formulation. Test it yourself. When you see what it does—you'll sell yourself that "here's a product that's going places!"

Arquad 2HT is distearyl dimethyl ammonium chloride. When it attaches itself to fibers, the polar or charged end of the cation tends to orient itself toward the fiber, leaving the 2 fatty tails exposed to contribute their softening characteristics to the goods.

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resin, since the Corvette's body was made of that resin and glass fiber. More recently—since the early part of last year—GM has turned to epoxies, which will work not only with the Corvette, but with metal-bodied cars, too. GM is currently selling the $15.75 kits at a rate of 700/month.

These kits have also found favor with boat enthusiasts, for putting truly water-tight, extra-smooth and hard surfaces on hulls. Besides GM and Permacel, Furane offers glass fiber kits.

Preferred Resin: In repair kits of all types, the preferred resins right now are epoxies. This is particularly true where the resin is to be used on metal —it has been pretty well established that epoxies adhere to metal better than do polyesters. (In kits not devised for metal repair, the polyesters are still leading.) Holding back the epoxies somewhat is price, roughly 50% higher than the price of polyesters.

A typical resin metal "solder" consists of the resin with the metal powder mixed in, along with a separate container of hardener, which is to be added just before use. The glass fiber kits generally have a clear resin (although it is sometimes darkened with carbon black to increase heat absorption), hardener, and a sheet of glass fiber. Powder silicates are sometimes included for use in the resin as thickeners or fillers.

These materials are outgrowths of products first developed during the tin-short war years. These were "solders" made of cellulose resins, softened with a volatile solvent, and filled with metal or silicate. A number of these materials are still sold—Boyle-Midway's Plasteel, Donner & Co.'s (Canada) Miracle Metal, to name two. Far lower in cost than the epoxy or polyester materials, and suitable for many uses, these have less adherence, less heat resistance, and, many claim, cannot be finished as smoothly as their newer rivals.

Hardener Problem: Besides their lower cost, the cellulose resin materials have the advantage of requiring no hardener—and no chore of mixing before use. The catalyst seems to be a major handicap of the epoxies now —most of them are polyamide hardeners that are hazardous when in prolonged contact with skin or when breathed for some time. Some firms feel the amount of catalyst used is critical, but not all agree (GM says that with its kit, anyone coming within 25% of the optimum amount will have a useful material; Permacel has made a point of its accurate, easy-measuring system).

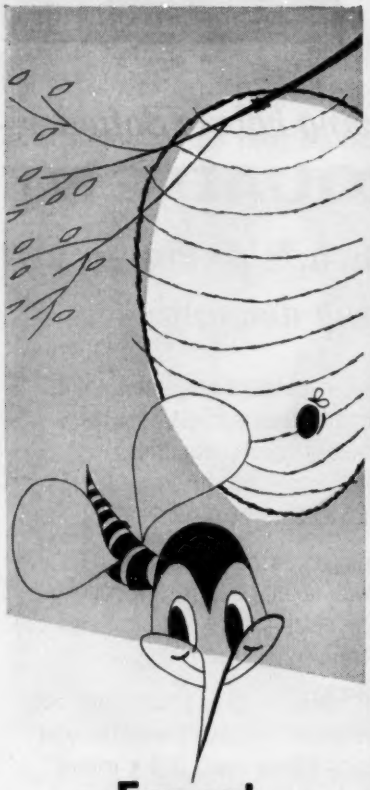
With the hardeners now used, room-temperature curing can be accomplished in 2-3 hours; most makers advise use of heat lamps to speed the process. Pot-life of the mixed-resin materials is generally about half an hour; Resolin says its materials can be kept for up to five days at —10 F temperatures. (Stability of unmixed materials is deemed indefinite.)

No matter how you look at the extra procedure of adding catalysts, there's no doubt that resin "solders" have their place. For body repair, they require less skill to use than do tin-lead materials; there's little danger of igniting gasoline, or heat-warping surfaces (problems where torches are used). The hardness of resin materials qualifies them for facing dies, repairing castings. Their extreme dimensional stability means they are useful for making precision molds; and their solvent resistance makes them a favored material for repairing pipelines or storage tanks for a variety of liquids. Types durable at temperatures up to 500 F are not uncommon.

Split Market: So far, these materials have been most used by industry. Aircraft manufacturers were early users, employing the resins more for tool- and jig-making than in the airframe structure itself. Now, the chemical industry, which needs corrosion-resistant repair products, is becoming a major consumer of plastics.

It's felt that until foolproof hardeners are available, there's no point in chancing householder misuse. Even Devcon, which is most active in luring home users, and which has had no consumer complaints, finds that only 25% of its sales are nonindustrial.

Several makers express great interest in the household market. But they're not going after it until they can whip the hardener problem completely, and until industrial demand slacks enough to make it worth while to divert effort from this area. The field is, so far (and perhaps for not much longer) untrammeled by patents. Just what will set sales of these resin repair materials booming, specialties makers don't know. But they're readying themselves for that day.



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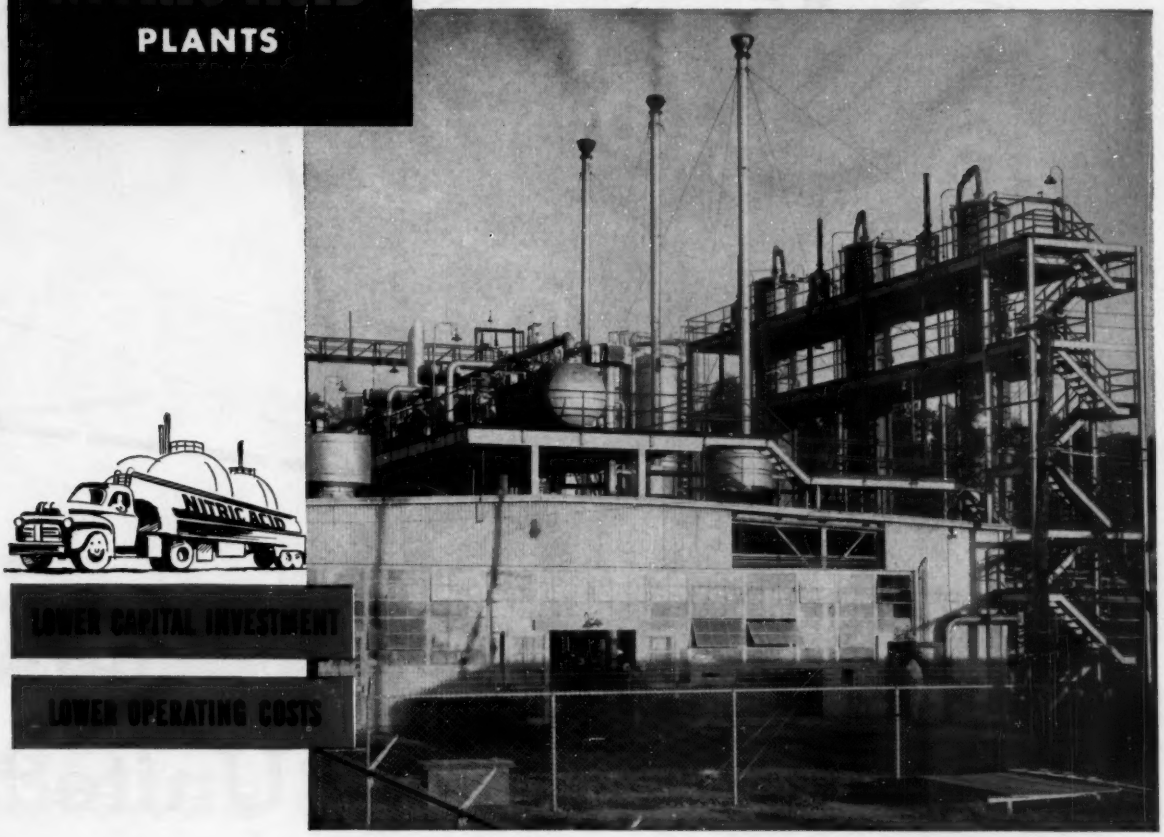

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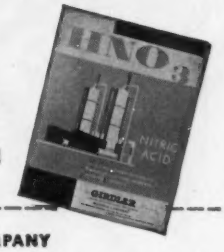

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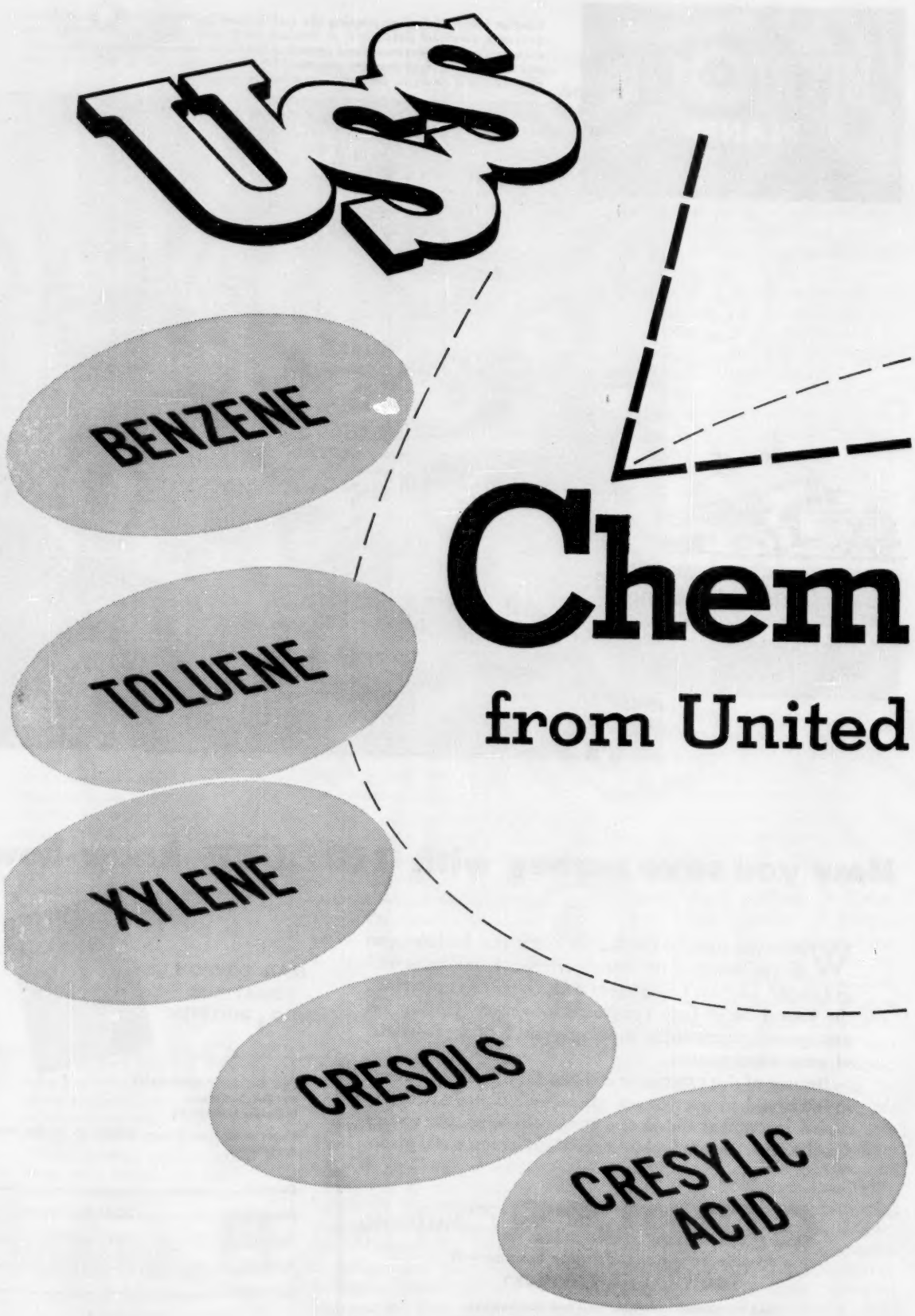
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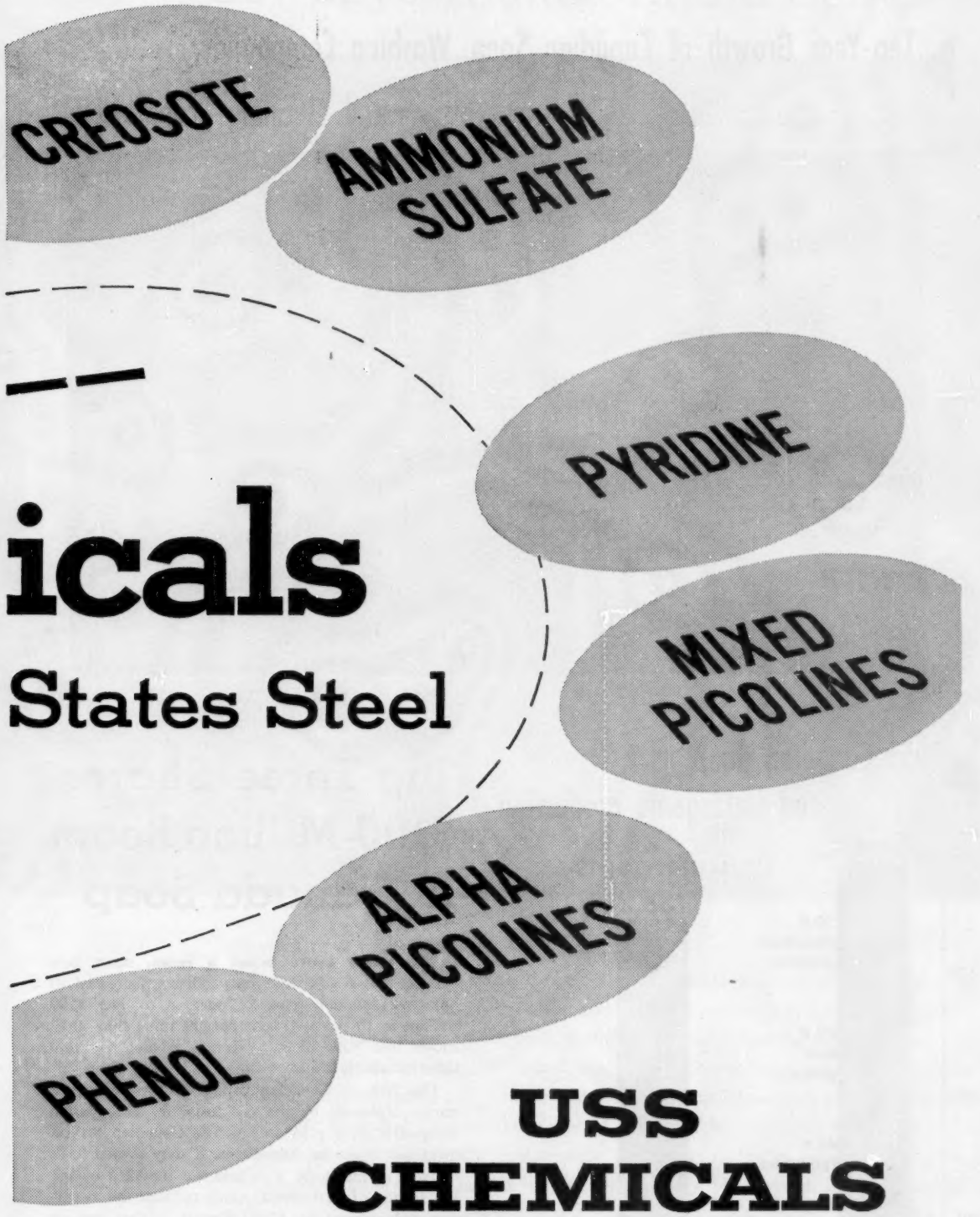
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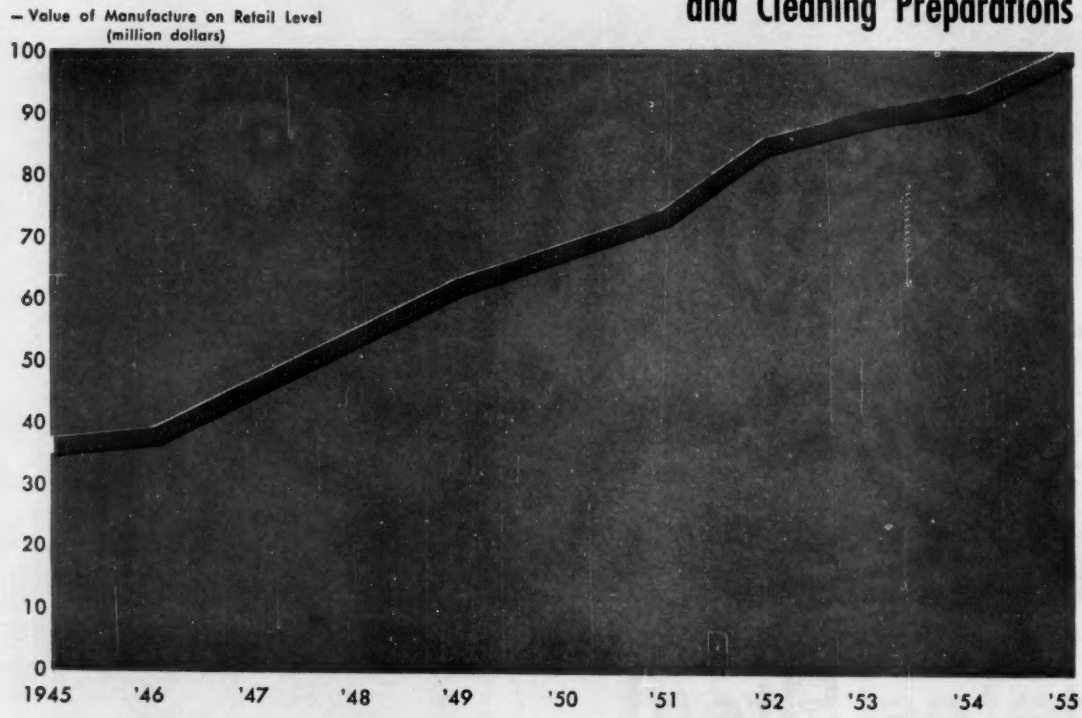
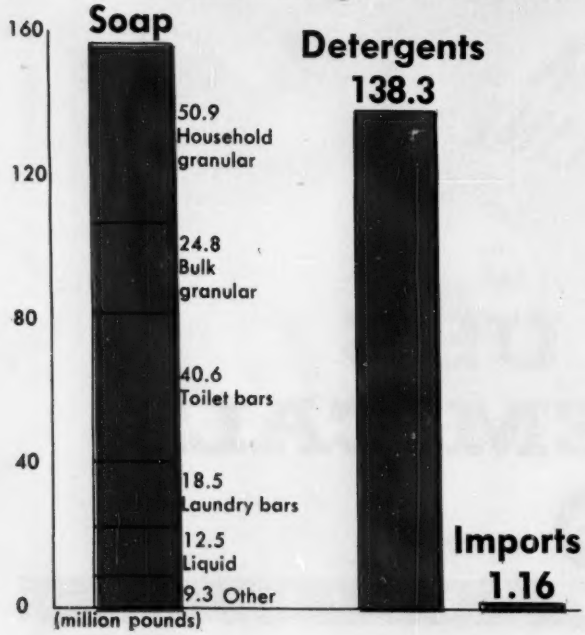
Ten-Year Growth of Canadian Soap, Washing Compounds, and Cleaning Preparations



1955 Canadian Soap and Detergents Production



'Big Three' Shares $100-Million Boom In Canada Soap

The charts above depict a boom, show how Canada's soap and detergents industry increased its annual production from $37 million to over $100 million in 10 years. One important thing they don't show: that 80% of this business is done by subsidiaries wholly owned by the U.S.'s "Big Three."*

The lack of Canadian capital in these plants is partly explained by the tax situation. U.S. parent companies have paid only a 5% Canadian tax on dividends from the subsidiaries if they owned 95% or more of the stock. This rule was modified by the last session of Parliament, which reduced the ownership requirement to 51%. Report is that one or more of the "Big Three" will take advantage of this, and offer stock to Canadians. This would be

*Canadian Lever Bros. Ltd. is, like the U.S. Lever Bros. Co., wholly owned by the Dutch-English Unilever combine. The only direct corporate relationship between the Canadian and U.S. subsidiaries is the fact that the head of the Canadian company, Charles A. Massey (brother of actor Raymond Massey), sits on the board of the U.S. firm.

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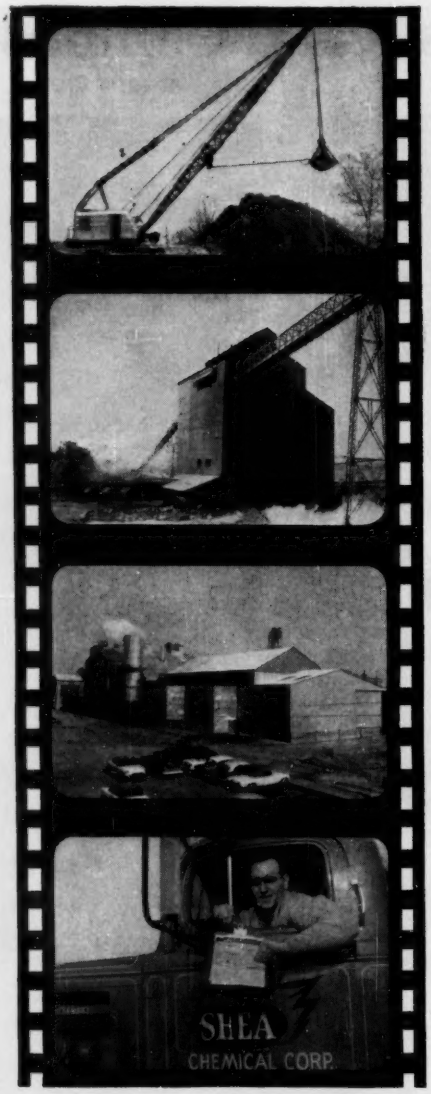

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mainly a bid for improved public—and government—relations; U.S. firms operating there feel a growing resentment against U.S. domination of certain local industries.

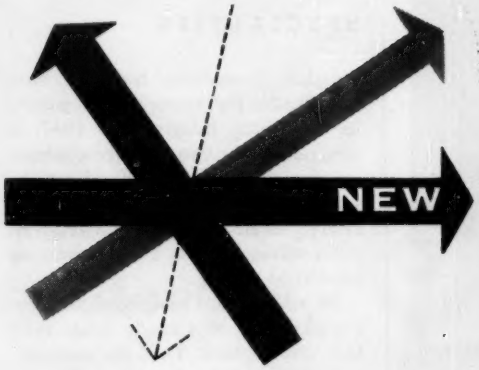
In the Raw: Canada's economy does profit, however, by the payrolls (soap employs 3,827 people) and sales of raw materials. The industry last year used about $45 million worth of materials, of which only about 20%, or $9.8 million, were imported.† Canada should become more self-sufficient in soap and detergent materials a year or 15 months from now when Imperial Oil Ltd. and Shell Oil Co. Ltd. both set up plants to produce detergent alkylate—which is now imported.

Partially because of these imports, but more due to the general level of prices, soap retail prices are higher in Canada. A package of Tide, for example, which might retail for 30¢ here, costs 42¢ in eastern Canada. Prices are still higher in western Canada, when cross-country shipping costs are added in. The market there isn't big enough to fully justify setting up plants as is done on the U.S. West Coast, and tariffs prevent western U.S. plants from supplying the demand.

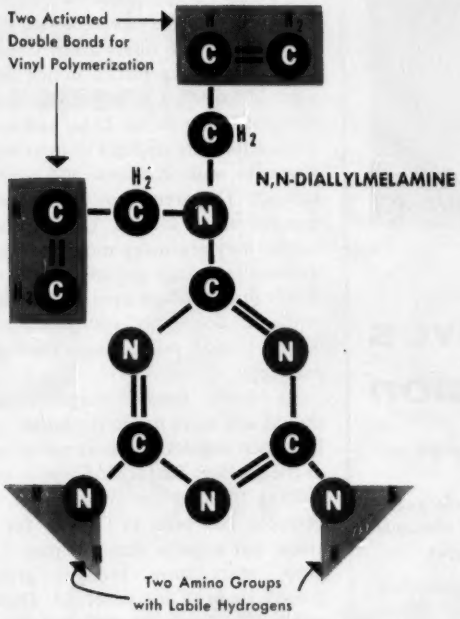
Riding the Surf: In the Canadian market, Lever Bros. gives P&G a lot stronger competition than it does in the U.S. In fact, it has in the past been the leading producer, although P&G is inching up, might be bigger by now. Lever's Surf is now believed to be the No. 1 seller among the laundry soaps and detergents, followed by P&G's Tide and Cheer. In light-duty detergents, Lux (Lever), Lux Liquid, and Vel (Colgate-Palmolive) are the big sellers. The top three bar soaps are Camay (P&G), Lux (Lever), and Palmolive (Colgate). The top strictly Canadian producers are Canada Packers, Ltd. (Toronto), with its Maple Leaf flakes and liquid, and the Javex Co. (Montreal), with its Gay.

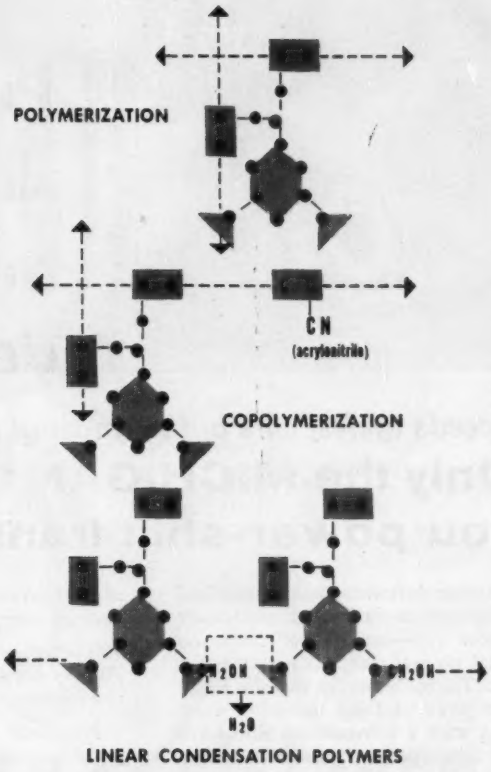
U.S. brands enjoy a tremendous promotion advantage over local or other foreign products. They get extra mileage out of their ads in U.S. magazines, radio, and TV shows, which are all eagerly followed in the Dominion, and are generally more popular than local offerings. The "Big Three" don't depend upon U.S. media alone

†Imports are now, to some extent, depended upon for precipitated chalk; Fuller's earth; lanolin; cocoanut and essential oils; palm, palm kernel and tall oils; potassium hydroxide; resin; tallow, grease and other soap stocks; beeswax and carnauba.



PRODUCT DIRECTIONS





A Polyfunctional Triazine with Polymerization Versatility

CYANAMID'S N,N-DIALLYLMELAMINE

The combined possibilities of vinyl polymerization and condensation in N,N-Diallylmelamine lead to a range of products with resin or polymer characteristics. Polymerization with azo or peroxide catalysts yields hard, cross-linked polymers. Curable resins are formed when N,N-Diallylmelamine is reacted with vinyl monomers . . . and with acrylonitrile, a cross-linked product receptive to acid dyes is obtained. Reaction with formaldehyde yields a monomethylol derivative which condenses on heating to a thermoplastic linear polymer. A dimethylol derivative is easily obtained, and this converts to a hard resin which is suitable for thermosetting polymerization.

N,N-Diallylmelamine and its derivatives are showing promise in molding compounds and surface coating resins. Further information on reactions and applications are given in our technical literature. Please write for a copy—or for experimental samples.

N,N-DIALLYLMELAMINE

White crystalline solid
Melting point 142°C
Solubility: (g/100 ml solvent at 30°C)

Acetone	5.5
Butyl cellosolve	16.0
Dioxane	21.0
Ethanol	4.0
Methanol	8.5
Water	0.01
Heptane	0.03

CYANAMID

AMERICAN CYANAMID COMPANY
New Product Development Department
30 Rockefeller Plaza, New York 20, New York

Please send me
☐ Literature on N,N-Diallylmelamine
☐ Sample of N,N-Diallylmelamine

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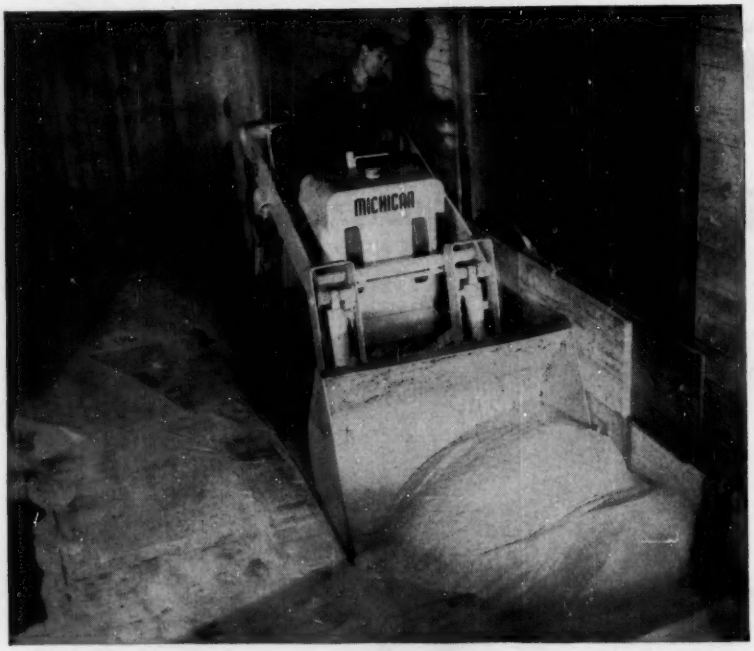

Speeds cycles, cuts bulk handling costs . . .

Only the MICHIGAN 12B gives you power-shift transmission

Power-shift transmission is standard equipment on the 15 cu. ft. MICHIGAN Model 12B—no engine clutch, no pedal, no gear clash. MICHIGAN is the only Tractor Shovel in this size range with power-shifting. Instead of wrestling with a conventional shift-lever and clutch pedal, the operator simply pushes a single lever on the steering column—like a modern car. High, low or reverse—make any shift instantly, even when travelling.

Entirely new power-train. For the constant stop-and-go, forward-reverse cycles of industrial bulk handling, Clark has designed and built an entirely new power-train for the Model 12B. This exclusive power-train is a completely integrated package, with each component matched to the others

Torque converter multiplies engine torque up to 300%—provides the extra push to climb grades or penetrate tight material.

Power-shift transmission makes all shifts hydraulically—cuts vital seconds off every cycle.

Planetary-wheel drive axle takes 70% of the torque load off the axle shaft—eliminates broken axles.

Not only does this power-train package make the MICHIGAN faster and easier to operate, it eliminates all the maintenance associated with an engine clutch and pedal. Furthermore, you deal with one single source for design, manufacture and service of all basic components.

Make your own comparison. The MICHIGAN Model 12B is simply more machine than any Tractor Shovel in its class. It is heavier and more powerful; it has low-level bucket action, complete dust protection features, and the exclusive Clark power-train. Before you buy an industrial Tractor Shovel, see this one in action. Write to arrange a demonstration of the MICHIGAN Model 12B on any job you name; clip the coupon to your letterhead and we'll do the rest.

Michigan is a registered trade mark of

CLARK® EQUIPMENT

Arrange demonstration of Model 12B:

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2459 Pipestone Road
Benton Harbor 30, Michigan

for their promotion, however. P&G of Canada, for example, has trebled its advertising budget since 1947, is now one of the two or three contenders for the title of top advertising spender in the Dominion. (One necessary local medium: publications, radio shows for the French-speaking population.)

Of a Different Color: Some of these brands differ in Canada from their U.S. counterparts. Duz, for example, a white soap here, is a blue detergent in Canada (with a premium—essential for good sales in some areas). The "Big Three" also offers a few Canada-only brands, like P&G's Bonus detergent. Most products are more heavily perfumed than in the U.S., and many require formula changes to meet wider ranges in water hardness and washing habits.‡ The trend among Canadian housewives is toward U.S. washday habits; they are using more automatic washers (although still to a far smaller extent than they are used in the U.S.), synthetic detergents (outselling soap 3 to 1), and purchasing ever-bigger packages.

As these trends progress, they should add more fire to the boom, give U.S. soap makers still more advantages in the market. So far, U.S. firms have nothing to complain about. P&G, for example, has been in Canada for 42 years, but reports that the past 8 of these years have brought greater growth than all the other 34. During this period, the company's dollar sales have risen to 3½ times those of 1947.

EXPANSION

Chicago Ink: Acme Printing Ink Co. (Chicago) has purchased an 18,000-sq.-ft. building, will use it to expand its rotogravure and flexographic divisions.

•

Auto Paint: Title to a 67-acre site near Dayton, O., has been obtained by Du Pont for $67,000. Du Pont will build an auto paint factory there, expects to begin production in '57.

•

Western Waxes: Ubatol, UBS Chemical Corp.'s (Cambridge, Mass.) polystyrene emulsion for floor polishes (*CW, Nov. 3, p. 92*) will be distributed to West Coast formulators by Everitt & Ray (Los Angeles).

‡In Quebec many housewives wash their clothing twice—first in cool water, then in warm. In the West, it's not unusual for women to use cold-water soaps to launder woolens.

locked-in protection for electrical properties

DAPON® resin

superior moisture resistance

Completely protected and locked-in—the excellent electrical properties inherent in cured DAPON resin are protected by the *resistance* of DAPON resin *to moisture in all forms.*

DAPON resin is the *new prepolymer* of diallyl phthalate—a dry white powder with improved properties. It is *easy to handle and store.* Its advent has made possible the use of diallyl phthalate in *all processing methods* for thermosetting resins.

Because the cure of DAPON resin involves addition polymerization, and not condensation, *moisture formation is non-existent* during cure.

Think of an electrical connector with *volume resistivity higher than that of porcelain* with complete protection that guarantees the retention of these properties under the most adverse conditions. This is DAPON resin.

Rid yourself of the moisture problem. Be assured of locked-in initial properties and locked out moisture. *Write now for technical literature containing properties, uses and methods of application for DAPON resin.*

Molding compounds containing DAPON resin are produced by Acme Resin Corporation, Durez Plastics Division, and Mesa Plastics Company.

OHIO-APEX DIVISION
Food Machinery and Chemical Corporation
Nitro, West Virginia
Department 46

fmc FOOD MACHINERY AND CHEMICAL CORPORATION

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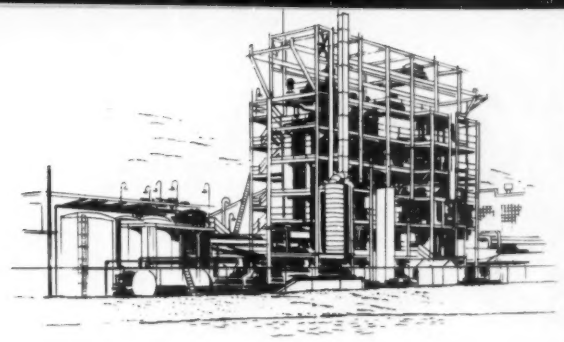


organic chemicals

FROM ROHM & HAAS COMPANY

Acrylic monomers

ACRYLIC ESTERS—A wide range of monomeric acrylate and methacrylate esters is available, providing a series of monomers whose polymers vary from very soft, rubber-like, film-forming materials to hard, transparent plastics. These esters may be polymerized by a variety of processes—bulk, suspension, solvent, and emulsion. They copolymerize readily with a large number of other monomers, permitting considerable modification in the physical properties of the resulting copolymers. *Typical uses:* Polymers and copolymers of monomeric acrylic esters are useful as thermoplastic sheets and molding powders, solvent coatings, binders for explosives, heat-resistant elastomers, adhesives, water-soluble thickeners, and emulsions for the textile, leather, paper, and paint fields. They are also used as intermediates for pharmaceuticals, photographic chemicals, and detergents.

ACRYLIC ACIDS—Both glacial acrylic and glacial methacrylic acid are available. These water-soluble acids may be polymerized to water-soluble polymers, or they may be copolymerized with other monomers to obtain polymers having varying degrees of solubility in alkali or water. *Typical uses:* The use of small quantities of these acrylic acids in copolymers can: 1) provide a product which can be vulcanized with metallic oxides without use of sulfur, or can be cross-linked with diepoxides, diamines, glycols, etc., 2) increase the mechanical stability of emulsions, 3) improve adhesion, 4) increase resistance to attack by oils. Amphoteric copolymers may be produced by copolymerization with basic monomers such as vinyl pyridine. The acids also serve as intermediates for the production of special esters such as glycol diacrylate and dimethacrylates.

OTHER MONOMERS—*Calcium acrylate* is a water-soluble monomer which may be used for soil stabilization. *Methacrylamide* is another water-soluble monomer, which can be polymerized to a water-soluble polyamide, or copolymerized to give a reactive group for cross-linking purposes.

The following acrylic monomers are available:

Commercial Quantities : Methyl acrylate • Ethyl acrylate • Butyl acrylate • 2-Ethylhexyl acrylate • Methyl methacrylate • Ethyl methacrylate • Butyl methacrylate • Hexyl methacrylate • Decyl-octyl methacrylate • Lauryl methacrylate • Stearyl methacrylate • Glacial methacrylic acid

Pilot Plant Quantities : Octyl acrylate • Methoxyethyl acrylate • Glacial acrylic acid • Calcium acrylate • Methacrylamide

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

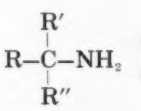
Representatives in principal foreign countries

Methylamines

Rohm & Haas methylamines, monomethylamine: CH_3NH_2, dimethylamine: $(CH_3)_2NH$, and trimethylamine: $(CH_3)_3N$ are very low-cost sources of basic organic nitrogen. All three amines are available in either aqueous or anhydrous form. *Typical uses:* The dimethyldithiocarbamates and tetramethylthiuram sulfides have shown usefulness as agricultural fungicides, accelerators for rubber vulcanization, and animal and insect repellents. Surface active agents are available by several synthetic routes starting with monomethylamine. Monomethylamine also is used in the preparation of p-methylaminophenol, the sodium salt of which is utilized in photographic developers. 1,3-Dimethylurea, produced from monomethylamine, is an intermediate in the synthesis of theophylline and caffeine. Monomethylamine is a raw material for a number of sympathomimetic drugs (e.g., N-methyl-phenethylamine or N-methylphenylpropylamine derivatives) and analgesics not related to or derived from morphine. Dimethylaminoethanol, an intermediate for local anesthetics and antihistamines, is prepared from dimethylamine. The preparation of choline chloride, widely used poultry feed additive, employs trimethylamine. Other uses for the methylamines include the production of high molecular weight quaternary ammonium salts, acidic-gas absorbents, and explosives. Commercially available.

Primene alkyl amines

The Primene® alkyl amines, Primene JM-T and Primene 81-R, primary amines, are free-flowing liquids having the general formula:

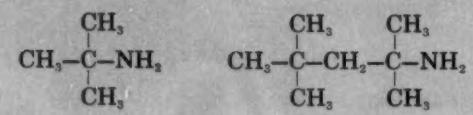


where R, R′ and R″ are alkyl groups.

Primene JM-T contains 18 to 24 carbon atoms; Primene 81-R, 12 to 15 carbon atoms. These products undergo most of the reactions typical of straight-chain primary amines. In some cases, however, their reactivity is unusual. They react, for example, with formaldehyde to yield relatively stable, monomeric azomethines ($RN=CH_2$). *Typical uses:* The excellent oil solubility, color stability, resistance to oxidation and fluidity of the Primene amines are advantageous in oil additives. Other suggested applications for derivatives include bactericides, fungicides, corrosion inhibitors, anti-oxidants, textile chemicals, and pharmaceutical products. Commercially available.

t-Alkyl amines

These amines, t-butylamine and t-octylamine, are light-colored liquids having the structural formulae:



t-Butylamine

t-Octylamine

Tertiary-butylamine boils at 44° to 50° C., tertiary-octylamine at 137° to 143° C. These amines undergo most of the reactions common to the primary amines, with some few exceptions. When reacted with aldehydes, for example, t-butylamine and t-octylamine yield relatively stable, monomeric aldimines (R-N=CHR′); with cyanogen chloride, stable monomeric cyanamides (R-NH-CN). The t-alkyl primary amines can be alkylated and alkoxylated to produce secondary amines, with the formation of very little tertiary amine. *Typical uses:* intermediates for rubber chemicals, insecticides, bactericides, oil additives, photographic chemicals, pharmaceuticals, surface active agents, corrosion inhibitors, and dyestuffs. Commercially available.

Priminox polyethoxy amines

These amines have the general formula:

$$R\text{-}NH(CH_2CH_2O)_nH$$

where n is the number of ethoxy groups and R represents a tertiary-alkyl group of 18 to 24 total carbon atoms. They are obtained by reaction of Primene JM-T with ethylene oxide. Priminox® 43, a liquid at room temperature, has one ethoxy group. It is soluble in aromatic hydrocarbons and common organic solvents. Priminox 10, also a liquid at room temperature, has 5 ethoxy groups. It is slightly soluble in oil and water. Priminox 21 has 15 ethoxy groups, is a paste at normal temperatures, and is soluble in water and aqueous acids. Priminox 32 has 25 ethoxy groups, is a solid at normal temperatures, and is soluble in water and aqueous acids. The Priminox amines effectively reduce surface and interfacial tension over a wide pH range, and are useful in low-foaming, efficient detergents. They are also suggested for use as bactericides, corrosion inhibitors, and fuel oil additives. Commercially available.

Dytol fatty alcohols

The Dytol® fatty alcohols are long-chain compounds having the general formula $CH_3(CH_2)_nOH$. Typical alcohol compositions of the various Dytol alcohols are given in the accompanying table.

The Dytol alcohols undergo many of the chemical reactions typical of alcohols. They may be ethoxylated, sulfated, esterified, halogenated, and dehydrated. They may be oxidized to aldehydes and carboxylic acids. *Typical uses:* As intermediates, the Dytol alcohols are useful in additives for cosmetics, polymerization regulators for rubber, textile finishing and softening agents, pharmaceutical quaternary ammonium compounds, and emulsifiers and detergents. Commercially available.

	Dytol A-24	Dytol B-35	Dytol E-46	Dytol J-68
% Decyl (C_{10})	1.5	1.5	none	1.0
% Lauryl (C_{12})	71.0	60.0	none	80.0
% Myristyl (C_{14})	27.0	25.0	1.2	19.0
% Cetyl (C_{16})	0.5	13.0	34.0	none
% Stearyl (C_{18})	none	0.5	64.8	none

Alkylphenols

Octylphenol, a light-colored, flaked solid and nonylphenol, a pale amber liquid, have these formulae:

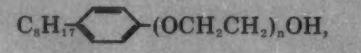
Octylphenol

Nonylphenol

Both alkylphenols are insoluble in water, but soluble in many common organic solvents. They undergo most of the reactions common to phenols; namely, nuclear substitution, esterification, etherification, and salt formation. *Typical uses:* Reaction with alkylene oxides yields non-ionic surface active agents, the solubility of which vary with the number of alkoxy groups. The alkylphenols may be reacted with aldehydes to produce phenolic resins; used in small quantities with other phenols in the preparation of phenolic resins, the alkylphenols serve to improve water resistance, oil solubility, and electrical properties. They also act as internal plasticizers. The reaction of alkylphenols with formaldehyde or with sulfur halides yields intermediates for lubricating oil antioxidants and detergents. Other products available through octyl- and nonylphenol include fungicides, germicides, rubber chemicals, pharmaceuticals, adhesives, and corrosion inhibitors. Octylphenol, in addition, stabilizes ethyl cellulose against deterioration by heat and light. Commercially available.

Triton surface-active agents . . . the nonionic octylphenoxyethanol series

Nine surface-active agents, reaction products of ethylene oxide with octylphenol, are available. They have the following general formula:



and may be arranged in order of increasing number of ethoxy groups:

Name	n	Name	n
OPE-1	1	Triton X-102	12-13
OPE-3	3	OPE-16	16
Triton X-45	5	OPE-20	20
Triton X-114	7-8	OPE-30	30
Triton X-100	9-10		

The solubility in water of these surface-active agents varies from relative insolubility (OPE-1 through Triton® X-45) to excellent solubility (higher members) over a wide temperature range in hard water and brine. The products designated OPE-1 through Triton X-102 are somewhat viscous, light-colored, 100 percent active liquids. OPE-16, OPE-20, and OPE-30 are waxy solids at room temperature, and to facilitate handling are supplied as 70 percent aqueous solutions. All of the materials are stable in acid and mild alkali and do not interact with cationic or anionic surface-active agents.

The OPE series of surface active agents are useful as wetting agents, emulsifiers, detergents, and wherever reduction of surface tension or interfacial tension is desired. Selection of the appropriate agent for any application, naturally, depends upon the characteristics of the system. In general, the diversity of the series should make it possible to select one or more products which will fulfill almost any need for a surface-active agent. Commercially available.

Other Rohm & Haas Products

ACRYLOID® oil additives

AMBERLITE® ion exchange resins

DITHANE® fungicide

PARAPLEX® and MONOPLEX® plasticizers

PARAPLEX polyester laminating, casting, and molding resins

PLEXIGLAS® acrylic plastic sheet and molding powder

RHOPLEX® acrylic emulsions for coatings and textile finishes

TRITON® surface active agents

Coatings resins
Disinfectants and sanitizers
Industrial enzymes
Insecticides
Larvacides and miticides
Leather chemicals
Paper chemicals
Plywood adhesives
Rubber chemicals
Textile chemicals
Thickening agents

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

U.S. chemical firm's South American plant . . .

Its staff may include—

- **Americans in most technical jobs**
- **Small, hard core of Americans in key jobs**
- **No Americans at all**

But, no matter how it's done . . .

Foreign Staffing's a Poser

The above plant, being rushed to completion in South America, belongs to an American firm. Like hundreds of other foreign plants built by Americans, it represents a golden opportunity for profits. Like hundreds of others, too, it represents a potentially giant headache—in finding the engineering talent needed to make it go.

There's no quick cure for the headache. But lessons learned from the experience of others can be a potent palliative.

Import or No: The first question you run up against in staffing an American plant overseas: Should you bring in American engineers, or try to hire nationals?

In general, companies that have tried it both ways agree that it's a good idea to lean as heavily as possible on local help. The ideal, they say, is to have the entire operation placed completely in charge of local help.

Although this goal is seldom attainable, you can go a long way toward achieving it by setting up adequate training programs. Some companies have found it possible to do this by pulling top men out of U.S. production jobs, assigning them temporarily to foreign plants to oversee the training operations. Others find it better to bring the nationals to the U.S. to learn how to operate plants.

And even in cases where it isn't possible to staff a plant completely with nationals, it's possible—most firms feel—to keep use of American staffers to a minimum—plant manager, an engineer and possibly a few line foremen. That way, the percentage of U.S. help can be held to 2% or less.

Where operations are unusually complex, this is not possible, of course. In oil refineries, for example, the percentage of American engineers runs closer to 4-5%, sometimes to 10%.

The specific country of operation is another important consideration. In many European countries, for instance, there's an abundance of skilled engineers available, whereas just the opposite is often true in Latin American countries.

And it isn't that the Latins lack the necessary technical aptitude. One top executive explains it this way: "Technically, they're sound. But they lack the initiative and aggressiveness needed to operate a modern chemical process plant at top efficiency." He feels, however, that both are acquired aptitudes and that it is only a question of time before the Latins pick them up. "We're a nation of tinkers," he says, "and mechanical ingenuity comes naturally to us." He feels, too, that the siestas and leisurely pace of Latin American countries are a result of the tropical climate and Spanish traditions. It's his opinion that the Latins will pick up the faster pace in time and eventually make topnotch plant administrators.

Who to Look For: In places where it is necessary to hire American engineers to run the plant, what kind of man works out best? On this, most firms feel you have to weigh his age, experience, adaptability, background, aggressiveness and family status.

The consensus, however, is that age is not as important as the man's general attitude. What's needed is a man who can readily adjust to local customs, living conditions and perhaps a new set of working conditions.

Where he's one of a small group to be sent to a particular area, most companies want him to have as much all-around experience as possible. For, in addition to handling his own job, he may have to train foremen, plant chemists, production planners, possibly even accountants and purchasing agents. And he must be his own trouble shooter, seldom has a trained staff to answer his problems.

For that reason, one company says it seldom picks men with less than 10 years' experience for overseas jobs. Often, some additional training is given to round out his experience. In some

cases, he may go through a year's training program.

Among companies with successful overseas operations, there's widespread agreement that married men are more satisfactory for plant jobs in foreign lands. It's felt that the married man, living with his family, makes a much more contented employee. Says one key man in a chemical firm's overseas division: "In addition to other considerations, bachelors are likely to go overboard in their efforts to avoid boredom, and manage to create bad will for themselves and our whole company. We make it a practice to hire married men almost exclusively—particularly in Latin America."

There are problems in hiring a married man, of course. There's the added cost of transporting his family, for one thing, though most firms feel that this is a relatively minor consideration.

More important, they feel, is how the man's wife feels about it. Says one chemical representative: "As far as we're concerned, the wife is almost as important as the man himself. She must be willing to start a brand-new way of life, adaptable enough to fit into a new community."

A difficult adjustment on the part of wives must be made when children must be sent to the U.S. to prep school or college. Many firms underwrite transportation to and from schools. A few also bring the mother or the whole family back to the U.S. for one of the school years.

What Lures Work: In view of the shortage of engineers for domestic jobs, it would seem probable that getting engineers to work in foreign plants would be just short of impossible. Recruiters, however, report that —provided the proper lures are offered—there is no scarcity of men willing to go overseas. (There's some feeling, too, that the coastal states are the most promising recruiting areas, that men from the plains states in particular are not eager for foreign service.)

"Romance is the key," says one. "Glamor, quaintness and charm of living in a foreign country are powerful incentives. And many respond strongly to the challenge of overseas work."

But one oil company man disagrees. "Money's the best lure. You can make more overseas. Taxes are often lower. Salaries are higher (some companies supplement with cost of living adjustments; one firm often gives its plant superintendents a percentage of the profits) because the jobs carry greater responsibility."

Men in domestic plants are sometimes eager to go because they are stymied in their present jobs. And all companies point out that foreign operations are growing, giving the individual a chance to grow with them. Then, too, job competition abroad is not as keen. But it's also likely that a mediocre man will fare no better than he would in the U.S.

Most companies find that turnover is less in foreign service. And if a man wants to come back to the states to work, the companies usually try hard to find a spot for him. He may have to take a pay cut; but in the long run, the broader experience he has gained helps him move ahead. This is particularly true of men sent out on temporary assignments to train foreign personnel.

When to Return? Communication between the foreign plants and the home office is always a problem. One company's trainees handle the flow of technical correspondence. When personal contact is needed, all firms send their top men over, often bring the field men back. One company makes a point of bringing key engineers back to this country at least once a year. During vacations at home (repatriation leaves), the production man usually checks with the home office and domestic plants to keep posted on new techniques.

But repatriation can be a problem in itself. In most companies, the man gets a yearly vacation in the foreign country, also accrues a month's home leave every year. Bringing him home every year, along with his family, is expensive. Some companies bring him home only once in three years. But then there's the job of finding a replacement for him for the three-month period. The most common compromise seems to be a two-month return every other year.

In short, repatriation problems—like the others—are not insurmountable. The important thing, most chemical men agree, is to be aware that they exist. As one vice-president put it: "The foreign plant can look like a pot of gold at the end of the rainbow. It can turn out to be a pot of trouble."

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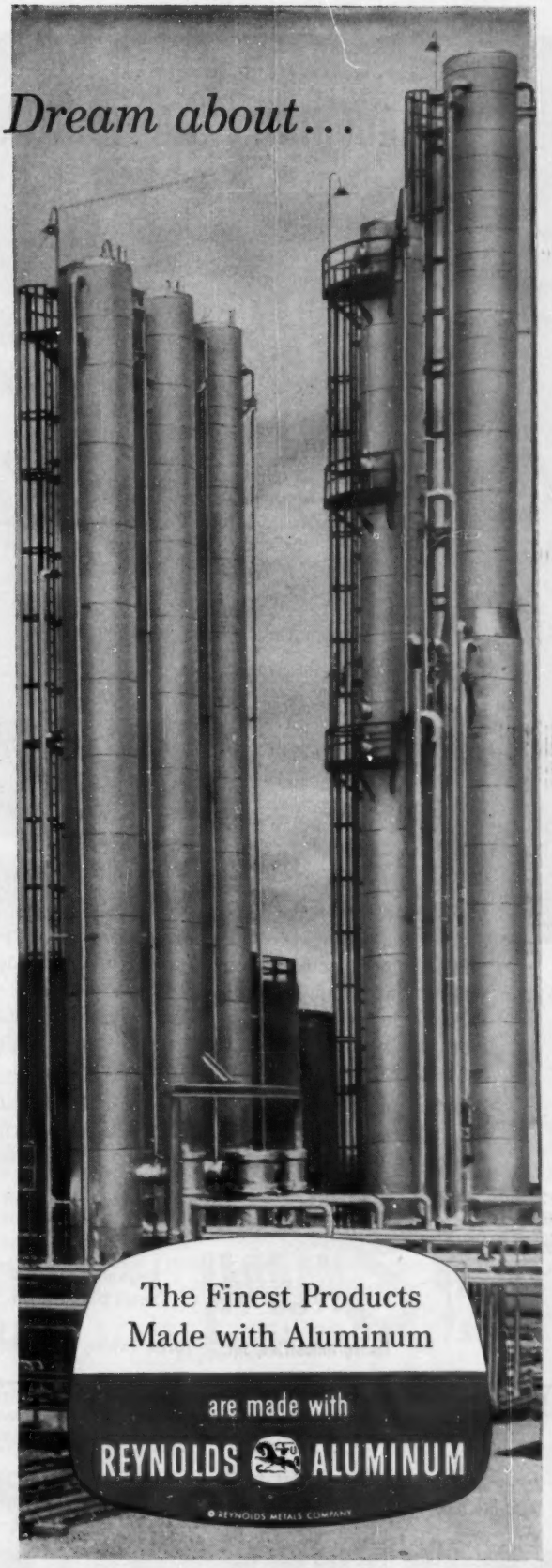
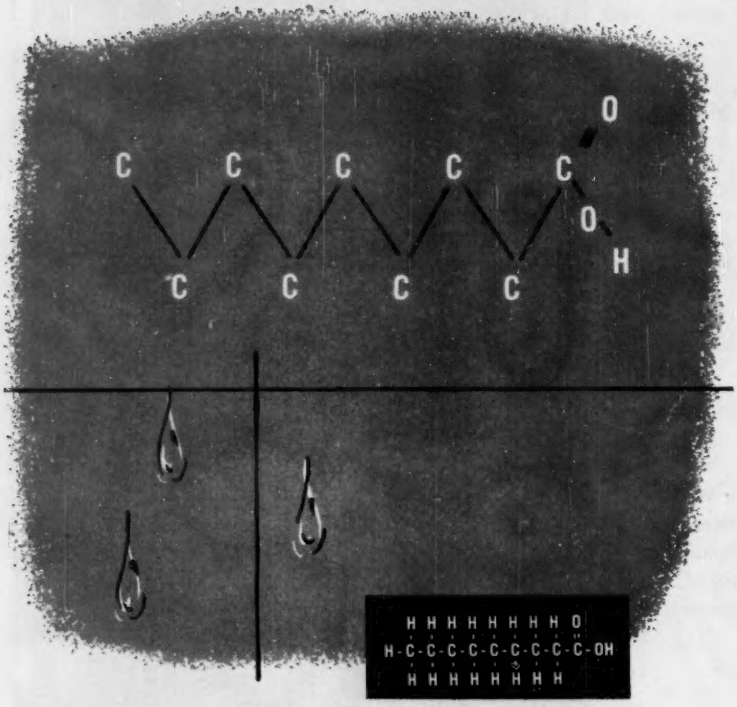


ODD CARBON LENGTH MAKES PELARGONIC ACID DIFFERENT...



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Unlike naturally occurring acids that belong to an even-carboned homologous series, pelargonic acid, a C_9 acid, offers a unique combination of properties and molecular weight that could lead to unusual end-products. Such products include *condensates*, *alcohols*, *metallic salts* and *esters* for such fields as plasticizers, detergent additives, synthetic lubricants, stabilizers, greases, alkyds, etc.

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PRODUCTION

Pollution Defense

Spurred on by the ever-present threat of smog, the Los Angeles Air Pollution Control District is speedily mobilizing 463 local industries for a new antismog campaign. The plan: a systematic shutdown of air-polluting industries when weather conditions threaten a bad attack. APCD reports that more than 200 plants have already submitted emergency shutdown plans, more than 200 others are currently mapping similar procedures.

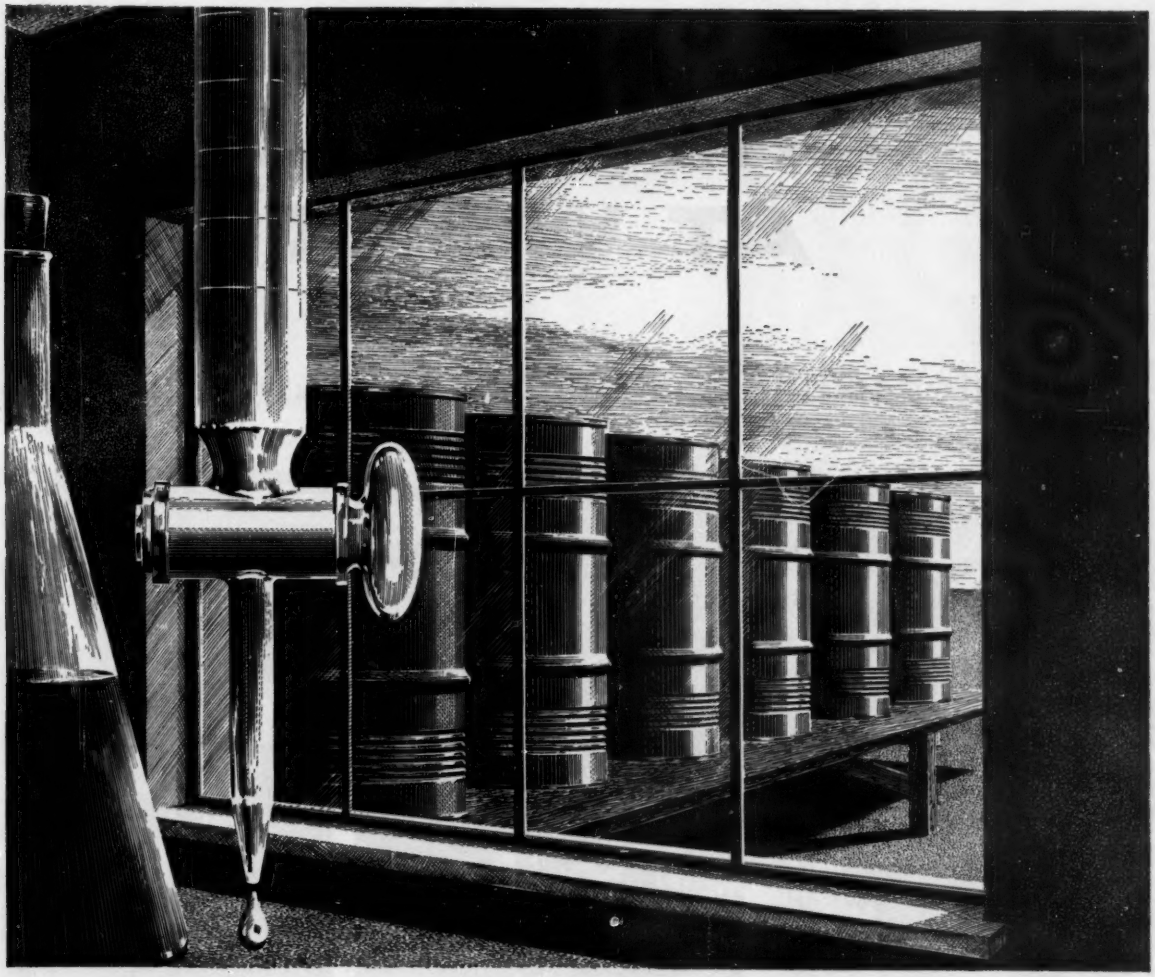
For its master plan, APCD is seeking information on the length of time required to shut down each plant, the operating schedule of each unit and the number of employees per shift that will be idled by an emergency work stoppage. The latter information will be used to estimate the effect of automobile exhaust pollutants created by a mass exodus of workers from shutdown plants.

First Step: As soon as all returns are in, plants will be grouped according to the contaminants they emit, their location and the time of day that contaminants are normaly exhausted into the atmosphere. The plans received so far have been placed in 10 categories of operation that are considered most critical. Included: petroleum refineries, chemical processing plants (except those engaged exclusively in packaging, mixing or blending less than 1,000 lbs./hour), steel furnaces and foundries, asphalt plants and paint or varnish plants.

Eventually the list will be expanded to include all sources capable of emitting hydrocarbons, ozone, carbon monoxide, sulfur dioxide or oxides of nitrogen. This will take in rubber, soap, detergent makers, and all processors emitting solvents.

To implement its smog defense plan, APCD will employ a selective coding device to flash smog alerts to more than 1,000 industries within its broadcast system. Instantaneous warnings will be triggered by more than 90 push buttons, each touching off a code frequency related to a single category of industry.

APCD hopes to have the plan in effect by the start of the next smog season—late June or July. And, though Los Angeles smog has never reached the stage where plants have had to shut down, the industrial mobilization plan is geared to cope with the worst.



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Shipping in USS Steel Drums means maintaining your own rigid quality control measures right into your customer's plant. Special measures taken in the manufacture of USS Steel Drums make them able to act as a rolling Fort Knox, keeping your product clean and pure—all the way.

To protect your product against contamination, every drum-body, head and bottom is freed of ALL manufacturing dirt, grease and scale. With component parts virtually "hospital clean" the drum-parts are ready for the final step. This consists of applying all inside and outside surfaces with a special phosphate solution that inhibits rusting and serves as an excellent bond for external paint application. The USS Steel Drum is ready for its job of protecting your product from contamination.

USS Steel Containers are available in sizes from 2½ to 110 gallons . . . with a wide variety of special fittings and openings to answer any need. Always specify product-protecting USS Steel Drums.

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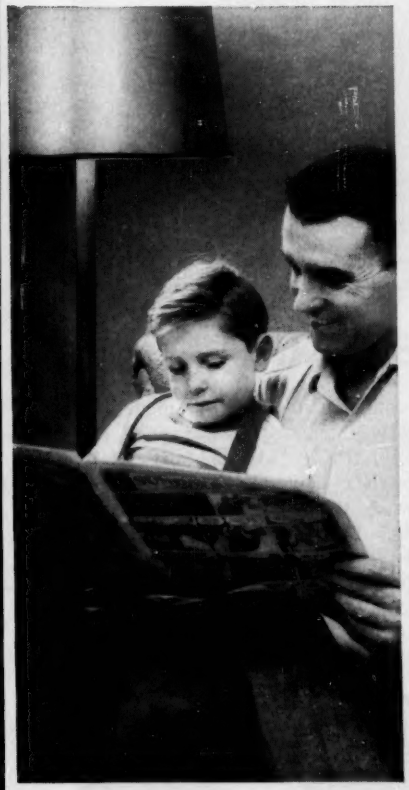
Keeping America's dairies clean requires a lot of detergent—over 150,000,000 pounds of dry detergent alone each year. Many of these cleaning compounds include as their basic detergent ingredient SULFRAMIN® AB 40 or AB Concentrate (sodium dodecylbenzene sulphonates). Uniform particle size, low dust formation and consistent effectiveness are the qualities which make these SULFRAMINS particularly suitable in this application. *Ultra Chemical Works, Inc., Paterson, New Jersey.*

BOON TO FARMERS

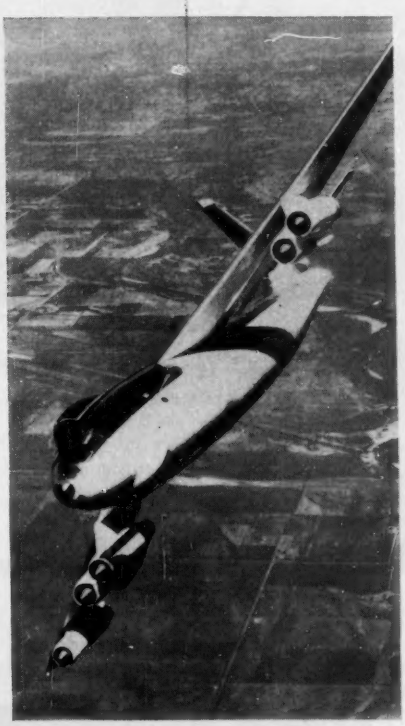
Field-mixed fertilizer-pesticide liquids are now made possible with new efficient, compatible EMCOL® emulsifiers. The new system broadens the range of fertilizers and toxicant combinations, makes for ease and economy of application. *Emulsol Chemical Corporation, Chicago, Ill.*

through Witco's emphasis on application



SHADES OF BLACK

WITCO-CONTINENTAL has developed a broad range of carbon black properties for news, publication and rotogravure inks. Such factors as shade density, jetness and undertone distinguish the various grades. *Continental Carbon Company, New York, N.Y.*



KEEPING GREASE GREASY

at temperatures colder than the North Pole, or three times hotter than the Amazon jungles, is a major problem in servicing America's jet bombers. Witco Lithium Stearates solve such problems, enabling greases to do their jobs at temperatures ranging from −90° F to 350° F. At the same time, they impart water resistance, elasticity and recovery to these vital lubricants.

One of the things you can't see in these pictures is possibly the most important ingredient in any Witco product...*application service.* We size up your needs—then draw on our knowledge of the application of our products to best fit them. Where we are confronted with a new problem, we can turn it over to the chemists in one of our technical service labs for a quick solution. For efficient and economical answers to your product and processing problems, write today.

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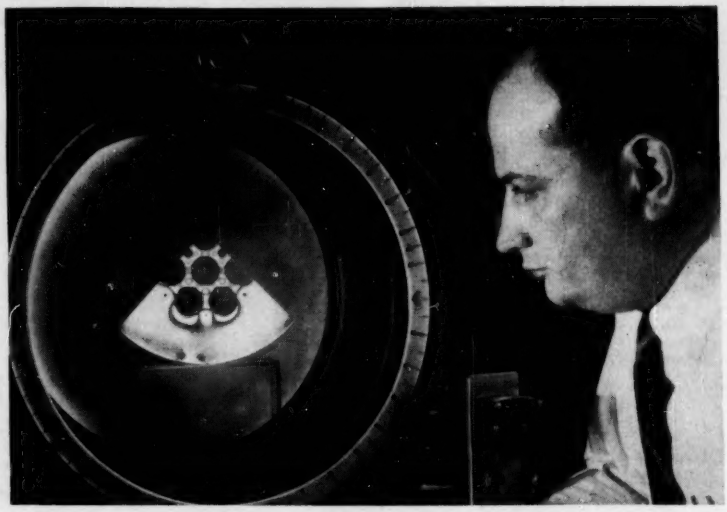
"Columbia" is a trade-mark of UCC.

Plastic Shows Reactor Stress

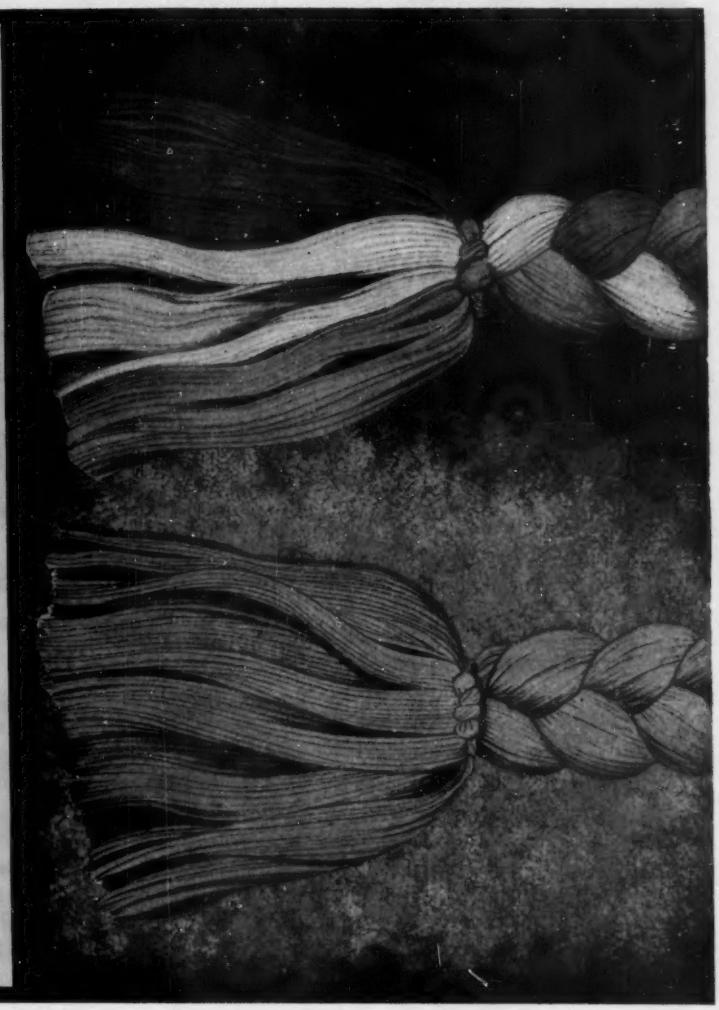
Toy-sized plastic pressure vessels, like the one above, are giving Westinghouse engineers greater insight into stresses occurring in nuclear reactors. Built with a photo-elastic resin, the scale model is cured while air pressure exerts stresses comparable to those created by pressurized water in the actual reactor vessel. Stress patterns become visible when sections cut from the model are viewed under polarized light (*below*). Key to the method: a phthalic anhydride curing agent that makes the photo-elastic resin (Bakelite's ERL 2774 epoxy) highly sensitive to stress. (Houghton Labs, Olean, N.Y., supplies epoxies—its 6,000 O.P. Series—for similar stress analysis work.)



EACH NOPCO CHEMICAL MAKES A PROBLEM OBSOLETE!

No "uninvited" colors

WITH THIS NOPCO SURFACE ACTIVE AGENT



Sometimes textile dyes are unpredictable. When a skein of wool or cotton shows up with unwelcome streaks, many dyers' remedy is the costly one of bleaching or stripping out part of the color, then re-dyeing.

But with a Nopco surface active agent that controls dye absorption, dyers get the *exact* shade they want—every time.

We've mentioned this example merely to show that Nopco research springs directly from practical needs. Other Nopco processing chemicals have achieved economies in many fields—from dispersing pitch particles to help make finer paper, to extending die life in wet-drawing wire, to reducing breakage waste for plastics molders by giving smooth release from the molds.

Whatever *your* most urgent production headache, give the Nopco chemists a chance to help. For quick action, write Nopco Chemical Company, Technical Research Department, Harrison, N. J.

NOPCO

PLANTS: Harrison, N. J.
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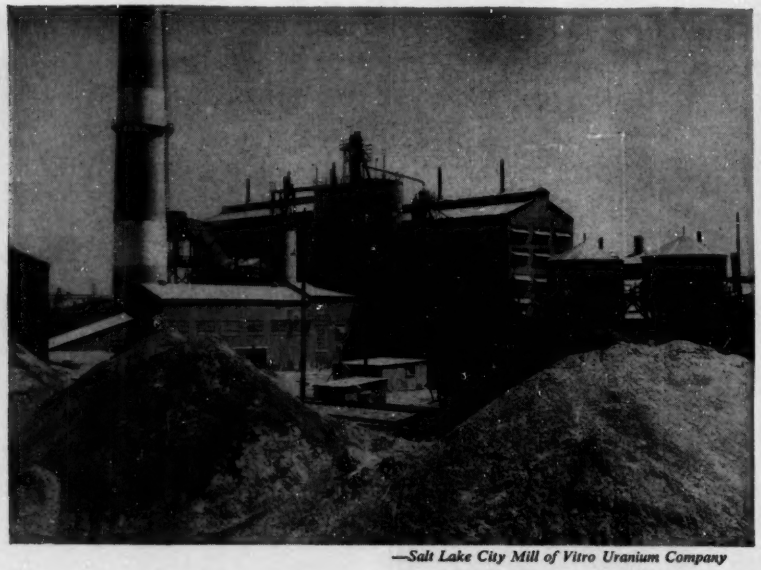
For: SURFACE LUBRICATION • DETERGENCY • SIZING • PLASTICISING • SOFTENING • EMULSIFYING • DISPERSING • WETTING DEFOAMING • THICKENING



—Salt Lake City Mill of Vitro Uranium Company

speaking of uranium milling...

BIG THINGS are going on in uranium milling and refining on the Colorado Plateau. One of the newest is the use of solvent extraction to concentrate uranium salts from the various ores.

For the past year Vitro Uranium Company has operated a pilot plant to determine the merits of solvent extraction. Results were so successful that Vitro will expand its mill and install "SX" to supplement the standard acid leaching process, with a marked increase in efficiency.

Vitro's Salt Lake City mill, one of the largest independent custom mills in the industry, is also one of the best—thanks in part to Vitro Engineering Division, oldest nuclear engineering firm, which designed and installed many of its outstanding features.

Strategically located with respect to major ore areas, the Vitro mill carries a sufficient stockpile of uranium ores to insure a constant supply of raw material. It has substantial ore supply contracts with Atlas Corporation, Four Corners Uranium Corporation and other major miners.

Vitro is always interested in new ore sources and potential suppliers are invited to contact the company. Vitro also offers engineering and consultation to others who desire to build new mills or install new processes.

For information write **VITRO URANIUM COMPANY,** *Salt Lake City, Utah*
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Thorium, rare earths, and heavy minerals
Recovery of rare metals and fine chemicals
Aircraft components and ordnance systems
Ceramic colors, pigments, and chemicals

PRODUCTION EQUIPMENT

Portable Fume-Exhauster: A new fume exhauster that can be moved to the fume source is offered by Engwald Corp. (Brooklyn, N.Y.). The unit (Model W-200-50), mounted on steel casters, is made up of a gasoline or electrically driven blower and 8 ft. of stainless-steel hose with arms and counterbalance for positioning. Up to 800 cu. ft./minute of fumes can be moved. Available hose diameters: 4, 6 and 8 in.

•

Expansion Joints: Badger Mfg. Co. (Cambridge, Mass.) has completely redesigned its line of packless, corrugated expansion joints for use in power, heating and process piping applications. The new design, says Badger, gives each corrugation a more effective height, greater flexibility, more uniform movement. Joints for high line pressures have wrought-steel reinforcing rings that maintain the hoop dimension of each corrugation. Joints come in any weldable alloy, e.g., stainless steel, Monel, Inconel or nickel, for 3- to 72-in. pipe diameters, and are normally equipped with internal liners of the same material to streamline the flow.

•

Atomic Flashlight: A flashlight that will give many years of service but which uses no batteries or external power source, is the new offering of New England Nuclear Corp. (Boston, Mass.). The flashlight is sealed in a water-tight case, is powered by a radioisotope. It is claimed to give off no harmful radiation, to lose only about half of the brightness in 12 years.

•

Filter Element: The new Rigimesh filter element of Aircraft Porous Media, Inc. (Glen Cove, N.Y.), affords accurate, unalterable particle-size retention, can be used for oxygen and nitrogen (gaseous or liquid), helium and other chemicals as well as the aircraft hydraulic systems for which it was designed. Plate-like elements are made by furnace-welding wire mesh at all contact points, can be cut, rolled, corrugated and welded without changing mesh uniformity. Various metals and alloys are offered for filters operating at temperatures from —65 to 900 F and pressures to 10,000 psi., with particle-size retention ratings ranging from 2 to 2,000 microns.

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EPOLENE is a new low-viscosity, low-molecular weight polyethylene wax— highly compatible and exceptionally uniform in quality

Epolene is a new synthetic wax, offering users the double advantages of steady supply and stable price.

Epolene is a hard, *tough* wax, comparing favorably in this respect with high-priced natural waxes such as carnauba. It is compatible with a wide range of other waxes, elastomers and resins. Its inherent toughness and its ability to plasticize other materials to which it is added extends its usefulness. Epolene is highly resistant to the attack of many chemicals and is not dissolved by organic solvents at room temperature. In polishes, it produces films of high gloss, high slip resistance and good scuff resistance.

Blended with other waxes, it increases hardness, melting point, blocking temperature, dielectric strength, abrasion resistance, toughness and flexibility.

Epolene is available in two forms: Epolene "N"—a non-emulsifiable type for direct blending with paraffin and other materials; Epolene "E"—an emulsifiable type for the preparation of emulsions used in the manufacture of polishes, paper, textile finishes and other coatings.

Epolene is easy to use. It comes in the form of pellets approximating the size of rice grains. These melt down rapidly for incorporation with other materials. In upgrading paraffin, Epolene can be quickly blended with the paraffin at temperatures as low as 180° F.

The outstanding uniformity of Epolene also contributes to its easy use and makes possible exact control of wax blending or emulsifying. Viscosity is low and carefully maintained from shipment to shipment. The acid number of the emulsifiable type is held within the narrow limits of 9—10. By standardizing on Epolene you can standardize your formulas and procedures.

Investigate the possible usefulness of Epolene in your product. Its versatile properties make it an interesting commercial material for many uses. For samples and further information, write EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, Chemicals Division, KINGSPORT, TENNESSEE.

OLD VERSUS NEW.
Scoop of Epolene pellets is shown alongside broken slabs of standard commercial wax. The convenient form of Epolene saves considerable time and expense in handling and processing.

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SALES OFFICES: **Eastman Chemical Products, Inc.,** Kingsport, Tennessee; New York City; Framingham, Mass.; Cincinnati; Cleveland; Chicago; St. Louis; Houston. **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

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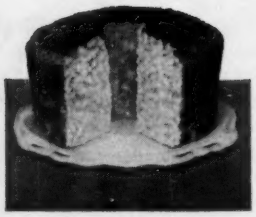

Is your business rubber, textiles, paper, organic synthesis? Or perhaps it's household detergents, jet turbine blades or color film processing. These are only a few of the many and diversified products and processes in which Becco peroxygen chemicals are used.

With scores of manufacturers Becco is first in peroxygens . . . and for a very sound reason. At Becco *every resource* is *concentrated* on research, quality control, manufacturing facilities and technical service for peroxygen chemicals and their application.

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Herbicides

Solvents

Starting point for chemical syntheses

Typical Properties	Isooctyl	Decyl
ASTM Distillation, D1078-49T		
Initial Boiling Point, °C	184	216
Dry Point, °C	190	223
Specify Gravity, 20/20 °C	0.833	0.839
Refractive Index, n_D^{20}	1.432	1.439
Color, APHA	10	10
Alcohol, Wt., %	99+	99+
Flash Point (Open Cup), °F	190	210

Send for Product Bulletins Nos. 22 and 23

INDOIL® CHEMICAL PRODUCTS

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910 South Michigan Avenue, Chicago 80, Illinois

PRODUCTION

Venturi Tube: Burgess-Manning Co.'s Penn Instruments Division (Philadelphia, Pa.) is out with a new lightweight Venturi tube, dubbed type PVF, for measurement of liquid and gas flow. The inner section is stainless steel surrounded with carbon or stainless-clad steel pipe. Sizes range from 6- to 96-in. diameters with a variety of end fittings. Single- or multiple-tap tubes are available.

•

Pneumatic Unloader: The Portaflow, made by Sprout, Waldron & Co., Inc. (Muncy, Pa.), is a new, portable, pneumatic unloader for conveying materials such as starch, sugar, clay, urea, phenolic molding compounds and synthetic resins from airslide cars. Mounted on an aluminum frame with independently adjustable wheels, the assembly weighs 1,045 lbs., can be handled by two men. Variable-speed drive allows adjustment of feed rate from the outlet of the airslide car, assures constant flow rate. The Portaflow is available for 3- and 4-in. conveying lines, will deliver more than 17 tons/hour.

Another new Sprout, Waldron offering is the Gyro-Shaker, a single-screen sifter for use where process temperatures require carbon or stainless steel construction, or where process areas must be dust free. The unit can be made gas-tight for sifting under inert gas pressure. Sifter's top cover and screen frame are made of aluminum for ease in handling.

•

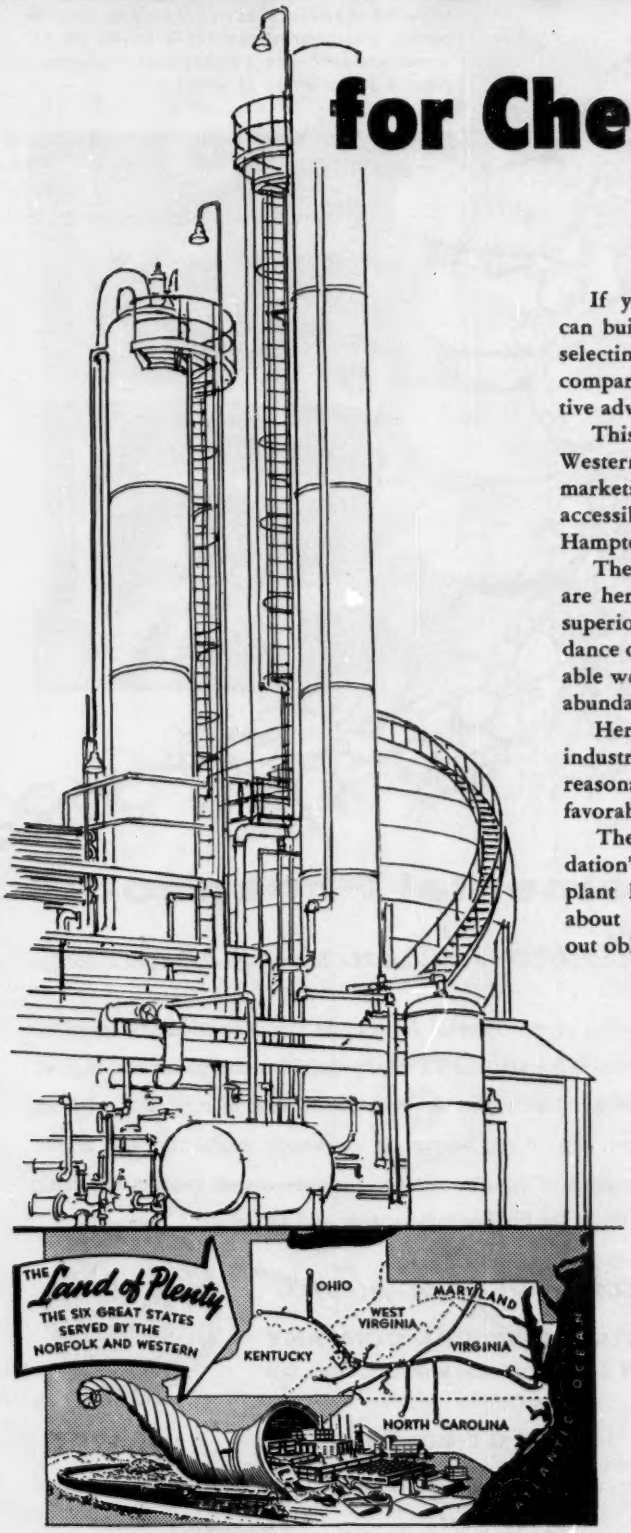
Eductors: Schutte and Koerting Co. (Cornwells Heights, Pa.) now offers unplasticized polyvinyl chloride eductors for chemical processing applications. They are suitable for liquid pumping and mixing operations, handle corrosive fluids (solids, too, when particle size permits). Six standard sizes from ½ to 3 in. have a maximum rating of 125 psi., 160 F.

•

Gamma-Ray Camera: A new, inexpensive, portable gamma-ray camera is available from the Industrial Division of Tracerlab, Inc. (Boston). It is a beaming-radiography camera, designed to use Cesium-137 or Iridium-192 as the radioactive isotope, produces a conical, 60-degree-wide beam. The camera comes in two models—E-37 for manual operation; E-39 for remote control with a 1-minute to 12-hour timer.

FIRM FOUNDATION

for Chemical Plants



If you're planning a new chemical plant, you can build it in any one of many states. But, before selecting a site, it will pay you to carefully check and compare the Land of Plenty's outstanding competitive advantages.

This six-state territory served by the Norfolk and Western is located near major consumer and industrial markets of the U. S. And world markets are readily accessible through the port of Norfolk on famed Hampton Roads.

The raw materials needed by the chemical industry are here, too. For example, there's a vast supply of superior all-purpose Bituminous Coal and an abundance of high-grade limestone. The force of dependable workers is large. Top-grade, low-cost power is abundant, and there's ample industrial water.

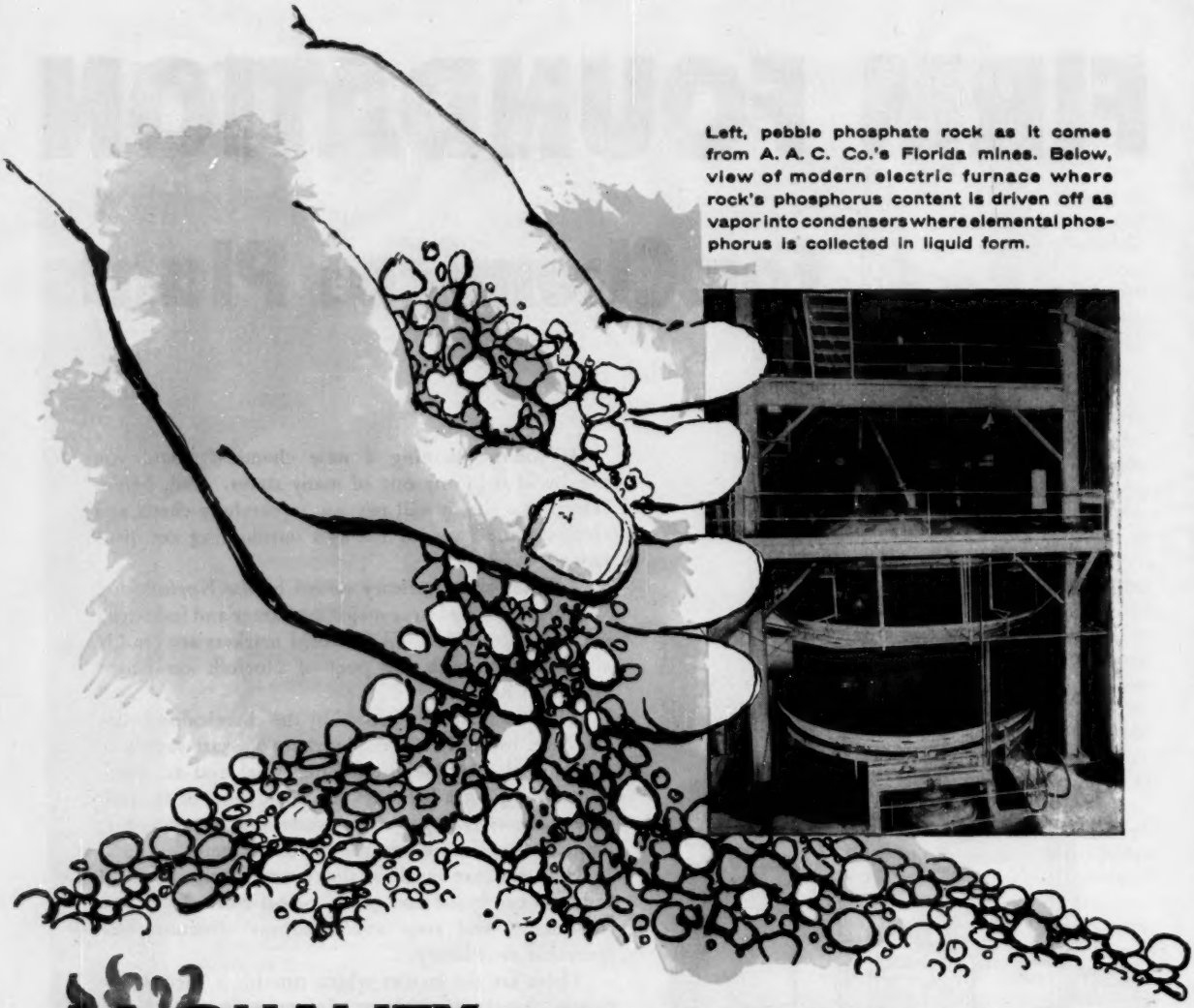
Here, too, are excellent sites on which the chemical industry can build and grow. Real estate levels are reasonable, and state and local tax structures are favorable to industry.

These are the factors which provide a "firm foundation" for chemical plants of any size or type. N&W plant location specialists will be glad to tell you about them in detail . . . in confidence and without obligation.

Write, Wire or Call—

L. E. Ward, Jr., Manager
Industrial and Agricultural Dept.
Drawer CW-740 (Phone 4-1451, Ext. 474)
Norfolk and Western Railway
Roanoke, Virginia

Norfolk and Western RAILWAY



Left, pebble phosphate rock as it comes from A. A. C. Co.'s Florida mines. Below, view of modern electric furnace where rock's phosphorus content is driven off as vapor into condensers where elemental phosphorus is collected in liquid form.

AA QUALITY Elemental Phosphorus

99.9% pure... Electro-Thermally produced

Elemental Phosphorus cake

Whether used in its 99.9% pure elemental form or in the ever-widening range of phosphorus derivatives and compounds, AA QUALITY Elemental Phosphorus assures highest standards of quality and uniformity. *Quality* you can rely on, because of rigid control from mines to finished products. *Service* you can depend on, because of large-scale production and ample phosphate rock reserves. Assured quality, security of supply, prompt service—sound reasons for using AA QUALITY Chemicals. Write for further information and samples.

"From our mines to your plant"

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY

Chemical Division: 50 Church Street, New York 7, N. Y. • 30 plants and offices serving U. S., Canada, Cuba

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY • AA QUALITY

REG U.S. PAT. OFF.

AA QUALITY PHOSPHORUS PRODUCTS

PHOSPHORUS AND PHOSPHORUS COMPOUNDS
Elemental Phosphorus (Yellow-White)
Phosphorus Red (Amorphous)
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Ferro Phosphorus (Iron Phosphide)

PHOSPHATES
Disodium Phosphate • Trisodium Phosphate
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PHOSPHORIC ACID
85% N. F. Grade • 75% Pure Food Grade
50% Pure Food Grade
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PHOSPHATE ROCK & FERTILIZERS
All grades Florida Pebble Phosphate Rock
Superphosphate
Complete Fertilizers

OTHER AA QUALITY PRODUCTS

FLUORIDES AND FLUOSILICATES
Sodium Fluoride • Ammonium Fluosilicate
Magnesium Fluosilicate
Potassium Fluosilicate
Sodium Fluosilicate • Zinc Fluosilicate
Fluosilicate Mixture
Ammonium Fluoborate
Aluminum Fluoride
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GELATIN
KEYSTONE® Gelatin: Edible, Photographic, Pharmaceutical, Technical

OTHER PRODUCTS
Animal Bone Charcoal
Bone Black Pigment (COSMIC® Blacks)
Keystone Ammonium Carbonate
Sulphuric Acid • Insecticides-Fungicides

Technology Newsletter

CHEMICAL WEEK
November 24, 1956

Du Pont this week is introducing a brand-new plastic material, Delrin acetal, a resin with an interesting combination of properties. It's tough, has a high melting point, dimensional stability, resists solvents and deformation. Biggest potential appears to be in engineering applications, e.g., for bearings or gears, applications in which the plastic should stand up well under a variety of conditions for prolonged periods.

A material that doesn't shrink nor swell could be important, for example, in close-tolerance parts in an engine that starts cold but heats up. Delrin resins are also being groomed for jobs in hand telephone sets, aerosol bottles, pipes, shower heads, wire coatings. In general, Du Pont feels, it will complement its line of nylon molding powders.

Production is still in the pilot stage. And the firm emphasizes that there's a lot of development work yet to be done. But the company makes it clear that it has high hopes for the plastic, that it is already conducting engineering studies for a commercial unit.

The resin will be sold in cylinders, ⅛ x ⅛ in. Two forms will be available—Delrin 500 X (for injection molding) and Delrin 150 X (for extrusion).

Du Pont is keeping mum about composition, at least for the time being. But it is based on formaldehyde. A good bet: a polyoxymethylene described in U.S. patent 2,768,994.

•

Standard Oil of Indiana will back its xylene oxidation process with a plant that will cost more than $10 million.

The plant will be rated at 60 million lbs./year, produce phthalic anhydride, isophthalic acid, terephthalic acid, dimethyl terephthalate, dimethyl isophthalate and benzoic acid. Location will be in the Midwest (the exact site hasn't been selected). Construction is due to start early next year, operations in 1958. Amoco Chemicals, an affiliated company, will build and operate the unit.

Indiana acquired rights to the process last year (*CW Technology Newsletter, Dec. 31, '55*) from Scientific Design Co. (New York) and has been working on it ever since. Not much is known about the process, believed to be liquid-phase, air-oxidation.

The move will put Indiana in competition with California Standard, which pioneered the manufacture of phthalic anhydride from *o*-xylene and recently built a new plant for making isophthalic acid and other xylene derivatives.

Sharples last week unveiled a new dry classifier. Tagged the Super Classifier, it works on the vortex principle, the same as that of cyclones. Big difference: it gets the particles up to rotational speed before they're subjected to the separating forces in the classification zone.

As Sharples (Philadelphia) sees it, this enables the machine to remove up to 90% of the fines in one pass, whereas other classifiers take out only 20%. And that means that small machines can handle big throughputs; the K-16 model, for instance, has a 16-in. diameter but can handle 1,000-3,000 lbs./hour.

•

Chas. Pfizer will make lysine in commercial quantities. The company developed a fermentation process that turns out a high-purity product of L-lysine (the active isomer) free of D-lysine (the isomer that's not utilized by the body). Product will be sold as the monohydrochloride, a fine white crystalline material, with a guaranteed potency of not less than 98%. Price range: $12/lb. (in 50-lb. lots), $14/lb. (in 1-lb. lots).

Pfizer says that one-fifth of the country's protein intake comes from cereals, a source deficient in lysine. Its new product, the firm reasons, should fill a needed role as a dietary supplement.

•

San Francisco Chemical Co. is going ahead with its $2-million expansion program (*CW Business Newsletter, Oct. 6*). Owned half by Stauffer and half by Mountain Copper, it will use a special Dorr-Oliver calciner to reduce the high carbon content of Western phosphatic shale, making it suitable for production of triple superphosphate and other fertilizers by Western Phosphates, Inc. (50% Stauffer-owned).

Although the calciner has never been tried in full-scale operation, it has been piloted at Montpelier. Essentially, it sets the carbon on fire and uses the heat to keep the process going.

•

The Atomic Energy Commission has tapped Du Pont to look into the economic and technological feasibility of heavy-water-moderated reactors for generating electric power. The study will be carried out under the existing contract between Du Pont and AEC for the operation of AEC's Savannah River plant. Du Pont will limit itself under the new agreement to design and development work—giving particular attention to use of natural uranium as the reactor fuel; the agreement makes no commitment, says AEC, for construction of a power reactor.

•

The glow in the night sky is not due to the moon and stars alone. It's due at least in part to a process involving sodium vapor. That's the conclusion reached by Air Force scientists after studying results of an experiment at Holloman Air Development Center at Alamogordo, N. M.

THE INSIDE STORY ON

ADSORPTION VERSATILITY

Here are some of the applications where new standards of efficiency and economy are being attained with Pittsburgh Activated Carbons

★ **CORN SUGAR REFINING**—Pittsburgh Granular Carbons provide higher quality, longer shelf life, reduced production costs.

★ **VINYL MONOMERS**—As a catalyst support, Pittsburgh Granular Carbons provide high conversion rates, long life and lower production costs.

★ **BUTADIENE**—In the removal of organic contaminants from a recirculating copper solution, Pittsburgh Granular Carbons have improved quality and reduced costs.

★ **CAUSTIC LIQUORS**—With Pittsburgh Granular Carbons, large streams of caustic liquors are being economically purified for repeated use.

How can these *coal-derived* Granular Carbons help you reduce costs and boost efficiency?

This booklet may suggest an answer

Describes uses of various types of Pittsburgh Activated Carbons in vapor and liquid phase applications. Send for your free copy today.

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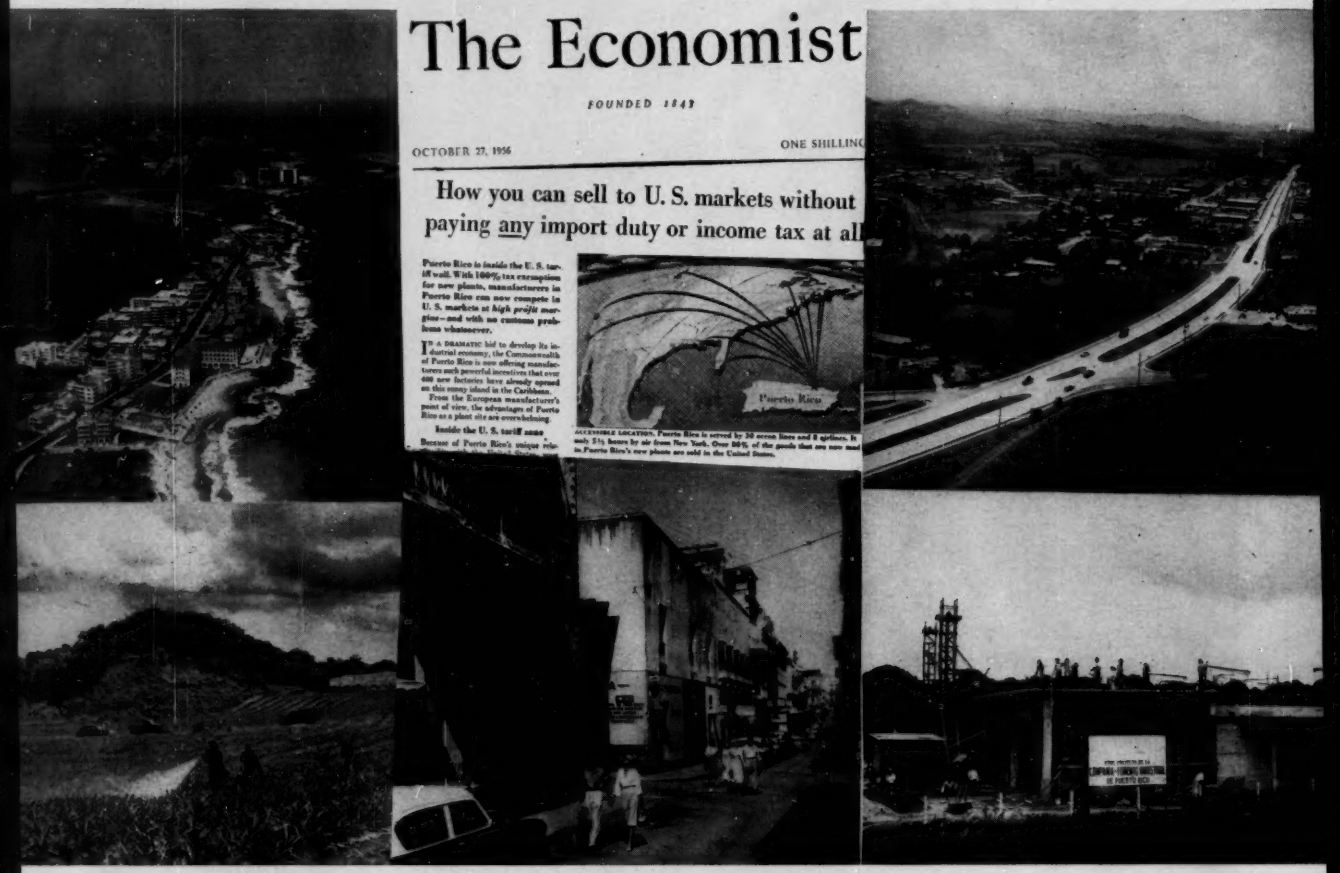

The Economist
FOUNDED 1843
OCTOBER 27, 1956
ONE SHILLING
How you can sell to U. S. markets without paying any import duty or income tax at all
Puerto Rico

PUERTO RICO turns to Europe for development investment. This could mean . . .

Back-Door Imports: How Big a Threat?

Import-conscious U.S. chemical companies are quietly concerned this week about the latest phase of Puerto Rico's drive for industrialization. The island's Economic Development Administration has begun a campaign to convince European manufacturers that Puerto Rico is a good place in which to set up shop.

Advertisements stressing the twin lures of a long tax-free period and the absence of U.S. tariffs on Puerto Rican-produced goods shipped to the mainland are being run in European publications (*see above*). A West German accounting firm, Deutsche-Waren-Treuhand, has been retained as a full-time consultant for Puerto Rico's European promotional efforts. Another representative, Ruprecht M. Hopfen, operating out of Frankfort, has approached continental manufacturers on the subject. And, Puerto Rico has applied for a free foreign trade zone.

How firmly Puerto Rico pursues its new course is a matter for conjecture right now. EDA officials in New York are jittery about the reaction of U.S. industry to a back door that's open to European imports. With an eye, perhaps, on the prospect of bad publicity, they describe the current program as "small."

There is some feeling, they say, that the program is a mistake. And they point out that the current European advertising budget* has been reduced from an original $12,000 to $5,300.

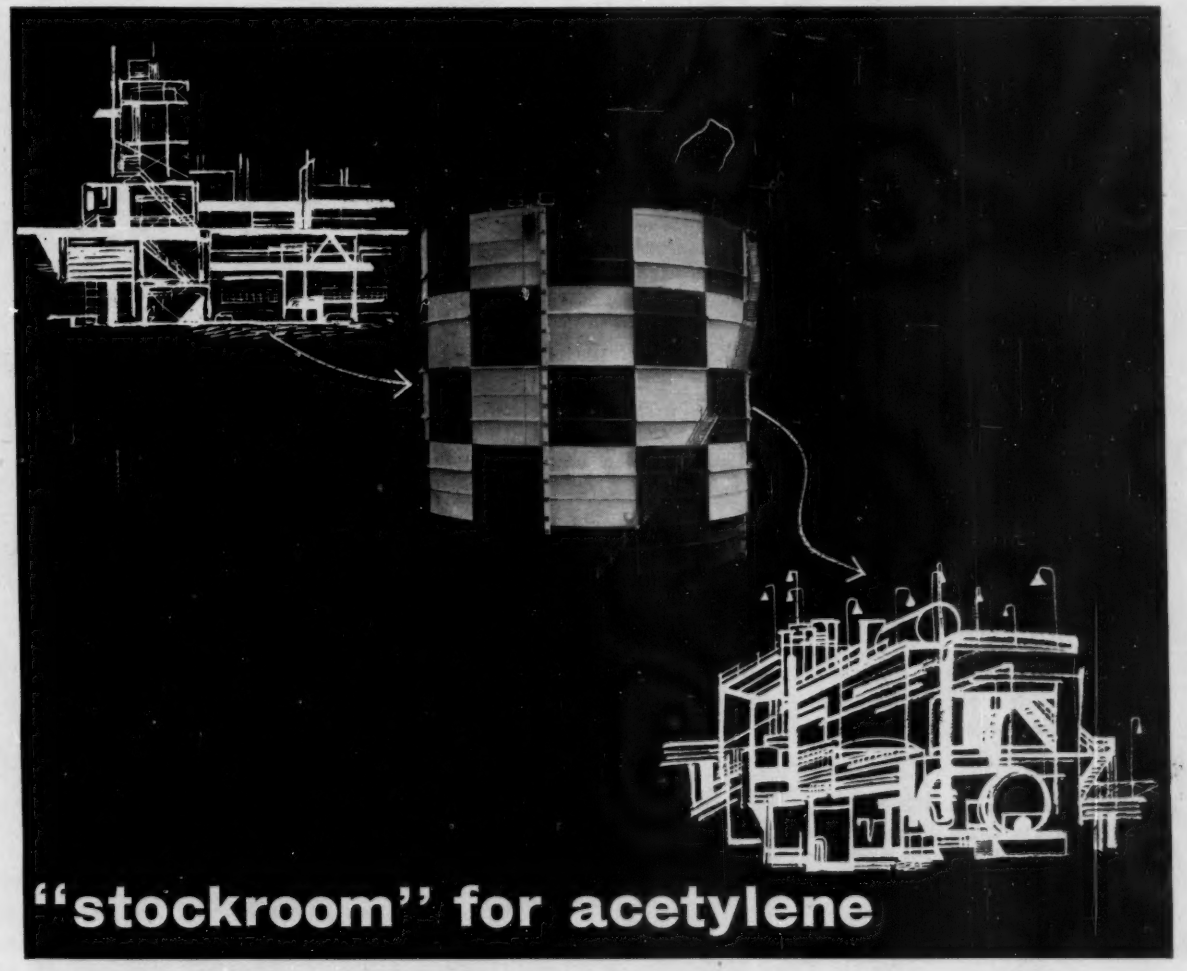
Understandably, domestic chemical producers are somewhat apprehensive.

The recent establishment of oil refineries on the island offers raw materials for chemical production.† And although Puerto Rico generally lacks raw materials, great reserves of high-grade silica and limestone do exist. Salt deposits are adequate, and oil prospecting is under way, though no oil has been found.

Such considerations indicate that Puerto Rico may have limited potential for chemical manufacturing. Puerto Rican officials say they are not specifically interested in chemicals and drugs; but they will talk to anyone considering the establishment of any type of industry in the commonwealth.

*The first ad appeared in the British weekly, *The Economist*. Others are scheduled for *Deutsche Zeitung Handelsblatt*, *Allgemeine Zeitung* and *Neu Zürich Zeitung*.

†Union Carbide's proposed $28.5-million ethylene glycol plant will use refinery gases.



Linde purchases Wiggins Gasholder for storage of acetylene between production and use cycles

When Linde Air Products Company's new acetylene plant in Montague, Michigan goes "on stream", a new 100,000-cubic-foot Wiggins Gasholder will play a vital role in the operation. Every cubic foot of acetylene produced will pass through the "stockroom" on its way to DuPont for use in the production of Neoprene. The gasholder will provide acetylene storage and will serve as surge capacity to enable Linde to satisfy both normal and emergency requirements.

If you produce, store or use gases, investigate the advantages of Wiggins Gasholders. They can be built to any capacity—from 50-cubic-feet to a million. Call or write General American for complete information.

WIGGINS VAPOR SEALS GENERAL AMERICAN TRADE MARK

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South La Salle Street, Chicago 90, Illinois.

Offices in Principal Cities

Still, the inducements offered to manufacturers should have a decided appeal to European chemical and drug concerns.

By locating factories on the island, European manufacturers would be producing within the U.S. customs area. Thus, they could tap U.S. mainland markets at a lower tariff rate; manufacturers must pay tariffs at the standard U.S. rate on imported raw materials, but they can ship the Puerto Rican-processed products to the mainland without additional duty, hence avoiding the higher rates collected on finished products. On mixed products, levy is made on that part of the mixture having the highest rate.

The second main inducement: a 10-year holiday from taxes. Puerto Rico's tax law approves exemptions for firms producing on a commercial scale "any manufactured product that was not produced on such scale on or before Jan. 2, 1947." Because of the minimal activitity before the prescribed date, the chemical process industries have little difficulty with the time limit.

When bulk raw materials are transformed in Puerto Raico to products with substantially different properties, there's an excellent chance that exemption may be obtained. In cases of doubt about the degree of transformation, the island government uses these criteria on which to base decisions:

- Nature and extent of previous processing, and feasibility of conducting the operation in Puerto Rico.
- Importance of product to other Puerto Rican industries.
- Magnitude of investment and of profits derived in Puerto Rico.
- Cost of the operation in Puerto Rico relative to total production cost.
- Magnitude of buying on the island for other components and supplies.
- Number of skilled workers needed.

A Puerto Rican free-trade zone would produce a third major incentive. Producers could receive raw materials from foreign countries for transshipment elsewhere without paying customs duties. After processing in the trade zone, the finished product could be shipped to another country without Puerto Rican tariff; if sold in the U.S., the only duty would be on raw materials. The free-trade zone would be attractive to European chemical producers with existing or potential Latin American markets. Shipping costs would be greatly reduced without an additional tariff burden. Puerto Rican wage scales are, however, considerably higher than the European scale. On Sept. 1, the wages of many workers in the island's chemical industry rose to $1/hour.

Most Puerto Rican chemical production is consumed on the island. Only 24% of some $23 million worth of Puerto Rican chemicals and allied products sold in 1954 were sold to the mainland.

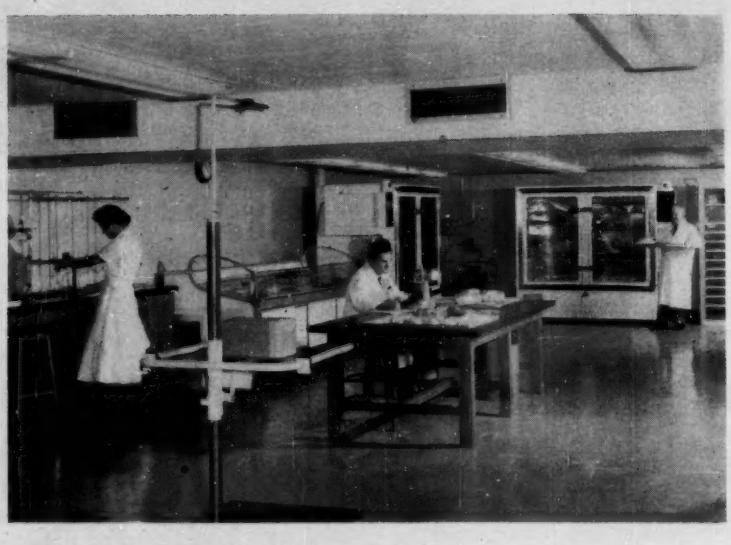
In Puerto Rico, officials are reticent to discuss their European endeavors but are "cautiously optimistic" about chances of success.

New York office director, John Snyder, believes the European bid "represents no threat" to the huge U.S. chemical industry. Many factors "overwhelmingly favor U.S. companies against foreign firms." European firms, he says, get no advantages not available to U.S. companies.

Some corporate quarters in the U.S. are inclined to take a "fatherly" attitude toward what they consider Puerto Rican folly. Their reasoning: the intelligent direction of the isle's industrialization has produced significant results. The European drive is "just a mistake" in an otherwise excellent program.

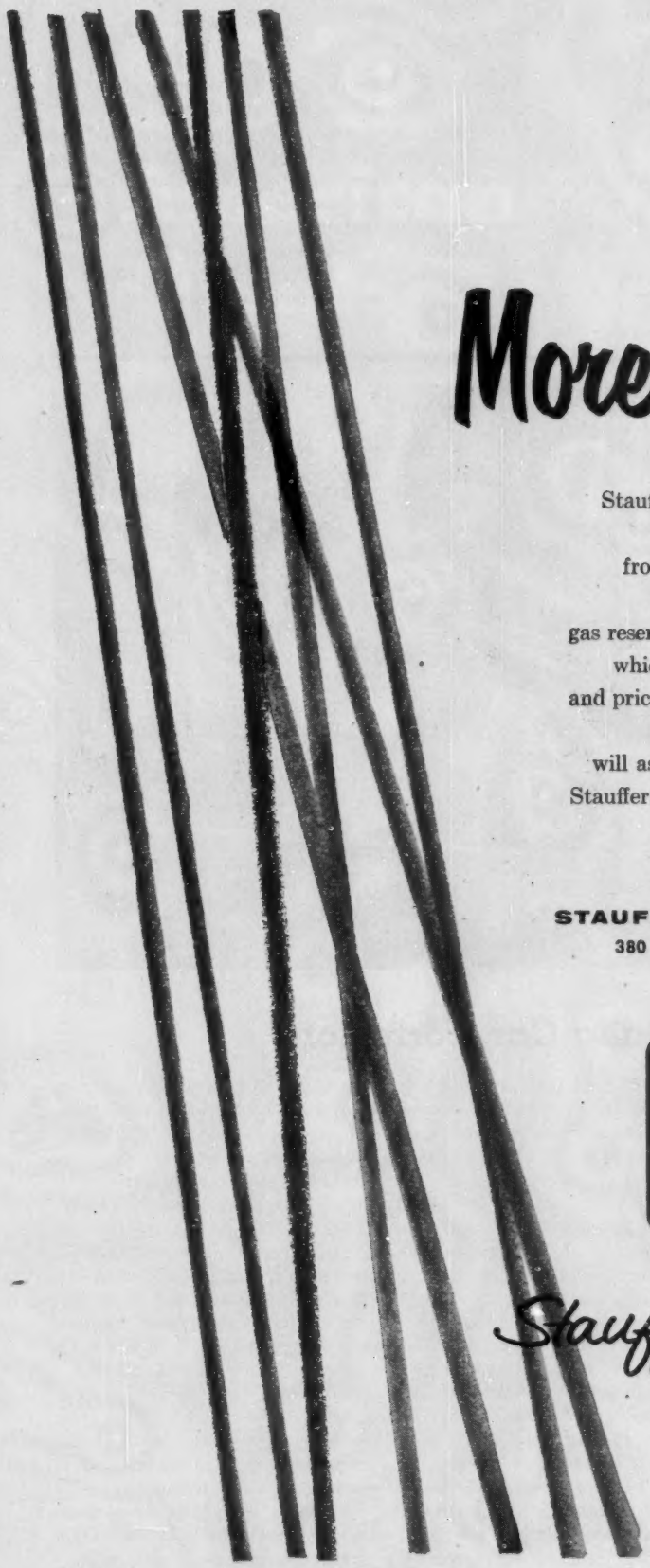
While a limited amount of European investment in Puerto Rico would probably do no harm to U.S. companies, wholesale use of the commonwealth as an "import loophole" might result in an investment boycott by domestic firms. Thus, European investment would not be in the best interests of Puerto Rico in the long run.

What future action Puerto Rico will take is not certain now. But it's clear that it cannot obtain substantial European investment without risking stormy reaction in the U.S.



Probes Problems of Packagers

JUST OPENED in Montreal, Can., is a new packaging laboratory for the films division of Du Pont Co. of Canada, Ltd. The new unit is designed and equipped to determine how well various films will perform in new applications. This evaluation service is slated for use by the company's customers who encounter packaging problems, but the lab will also be a testing ground for experimental films. Most of the work will concern moisture problems and heat-sealing. For the latter, Du Pont says it has developed new tests in which it can regulate for three variables: temperature, pressure and dwell-time.



More CARBON BISULFIDE!

Stauffer's new plant at Le Moyne, Alabama, is now producing carbon bisulfide from natural gas and sulfur.

The location in an area of enormous gas reserves provides a supply of raw materials which will tend to eliminate the instability and price fluctuations of the wood charcoal market.

The huge capacity of the new plant will assure continuance of the service for which Stauffer has long been known in the Rayon industry.

Purity meets Stauffer Standards.

STAUFFER CHEMICAL COMPANY
380 Madison Avenue, New York 17, N. Y.
Telephone: OXford 7-0600

Stauffer CHEMICALS SINCE 1885

Stauffer means service

COMPETITION

• Borax & Chemicals, Ltd., British subsidiary of American Potash & Chemical Corp., has just completed a new storage warehouse for bagged potash at Bottle (near Liverpool), England. Built to accommodate AP & CC's increased shipments of boron chemicals to the U.K., the 66,000-cu.-ft. warehouse has storage capacity for 1,000 tons.

• Abbott Laboratories has set up a distribution center in Jacksonville, Fla. Slated for completion by March, the center will distribute Abbott products to all of Florida, south Georgia and the coastal area of South Carolina.

• Dow's Texas Division has just become the home of the third Dow plastics technical service branch to be established outside of Midland, Mich. Purpose of the group is to help integrate research and production. The other two branches are located at Allyn's Point, Conn., and Torrance, Calif.

• Chas. Pfizer & Co. has opened its fifth and largest distribution center. Part of its branch expansion program, the new center, on Chicago's west side, will serve customers in a 15-state area. The 2-story brick-and-concrete structure contains 79,000 sq. ft. of warehouse space, 20,000 sq. ft. of office space. All four of the company's domestic marketing divisions—Pfizer Labs., J. B. Roerig & Co., Chemical Sales, and Agricultural Sales—will have regional headquarters in the new center.

• Shawinigan Resins Corp. will have a new southern district sales office at Atlanta, Ga.

• Du Pont has created a new department, elastomer chemicals, to be responsible for research, production and sales of all products currently handled by the Elastomers Division of the company's organic chemicals department. The new unit, in addition to neoprene and rubber chemicals, will manufacture and market Hypalon synthetic rubber and Hylene organic isocyanates.

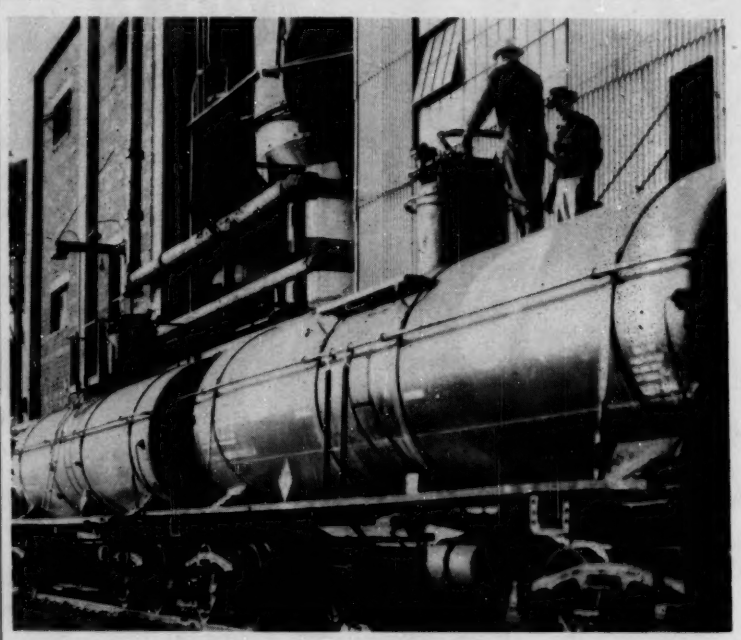
• Magnet Cove Barium Corp. (Malvern, Ark.) has completed construction of new mining and shiploading facilities on the island of Mykonos, Greece, and will start shipping high-quality barite this month.

• Smith Chemical & Color Co., Inc. (Brooklyn), has been appointed U.S. representative for Magnesiet-En Amaril-Fabrieken (Vlaardingen, Holland) for the sale of various grades of magnesite. MAF is the largest and oldest European miner and manufacturer of the material.

• The Chemical Dept. of McKesson & Robbins has established a new sales district at Providence, R. I., covering the New England states. In the next two years, the New England district will add at least three more chemical sales offices and warehouses.

• Celanese Corp. has opened two new sales offices for its Chemical Division, at Wilmington, Del., and Detroit.

• Stanton Sales Co., manufacturers' representatives, has been appointed exclusive sales agents in the



Braking Car Corrosion

CONTROL of corrosion affecting equipment for transporting, storing and handling ammonia solutions may be possible with a new product soon to be marketed by National Aluminate Corp. The company says that preliminary studies of the corrosion-inhibiting properties of a blended inorganic and organic inhibitor, Nalco 889, point to an answer to a long-standing corrosion problem.

Nitrogen fertilizer solutions cause serious corrosion of carbon steel containers, and aluminum containers are too expensive; nobody has yet come up with a completely satisfactory coating (*CW, April 28, p. 43*).

Nalco's material has been tested on only urea-ammonia solutions. Used at a concentration of 300 ppm., the product reduced the corrosion rate some 94%. The concentration level works out to about 0.003 lbs./gal. at a cost of about 0.0005¢/gal. National Aluminate has not yet worked out a cost comparision of the inhibitor versus specialized equipment.

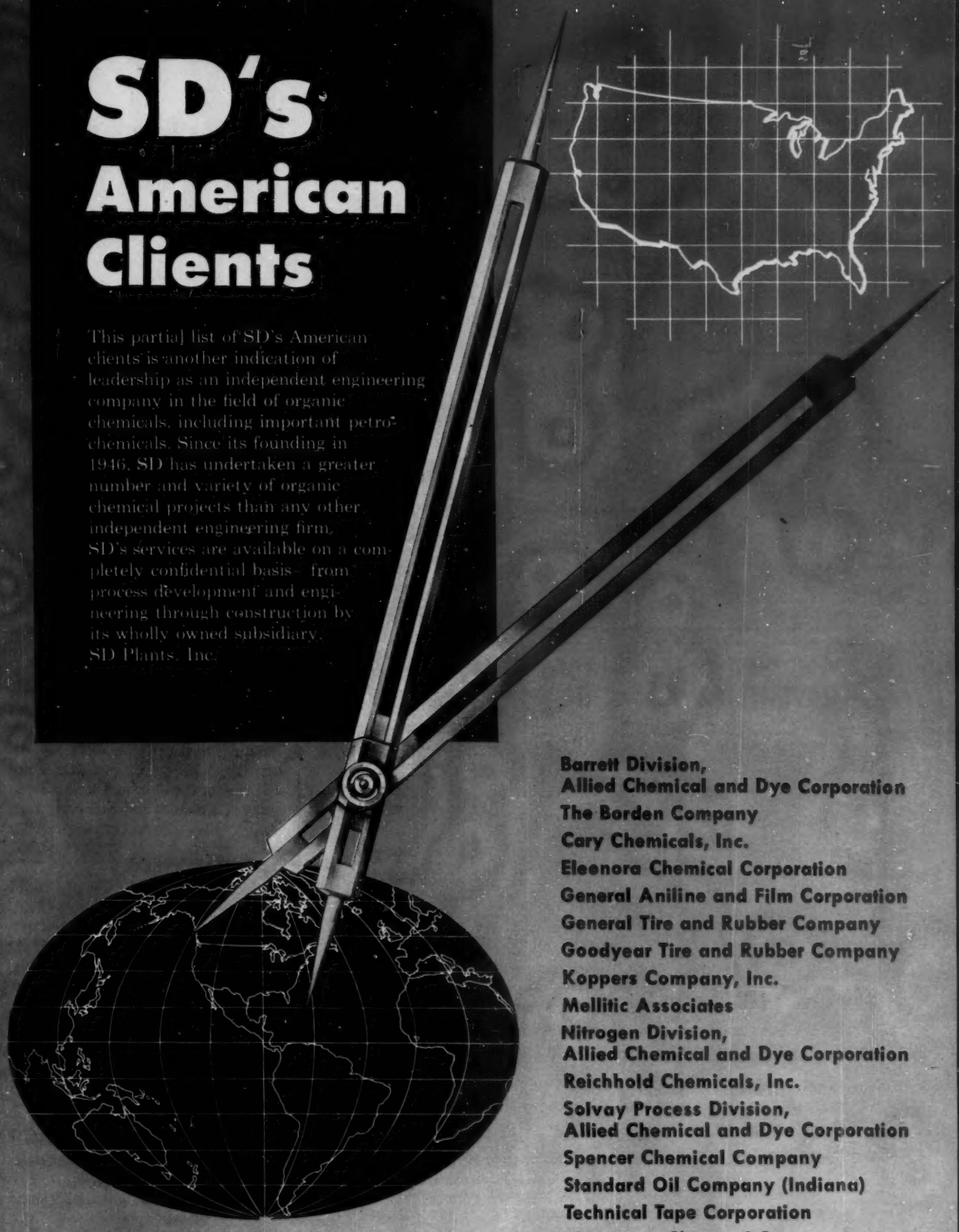
The company claims another big advantage for its product: since the solution can be inhibited at the production point, specialized handling and storage equipment in the distribution chain is unnecessary.

Nalco 889 can be added in a variety of ways and will be made available in 1-lb. briquettes. The corrosion protection is believed to result from a film-formation.

Although work has been done only on ammonia solutions, other corrosion applications may exist.

SD's American Clients

This partial list of SD's American clients is another indication of leadership as an independent engineering company in the field of organic chemicals, including important petrochemicals. Since its founding in 1946, SD has undertaken a greater number and variety of organic chemical projects than any other independent engineering firm. SD's services are available on a completely confidential basis— from process development and engineering through construction by its wholly owned subsidiary, SD Plants, Inc.



Barrett Division,
Allied Chemical and Dye Corporation
The Borden Company
Cary Chemicals, Inc.
Eleonora Chemical Corporation
General Aniline and Film Corporation
General Tire and Rubber Company
Goodyear Tire and Rubber Company
Koppers Company, Inc.
Mellitic Associates
Nitrogen Division,
Allied Chemical and Dye Corporation
Reichhold Chemicals, Inc.
Solvay Process Division,
Allied Chemical and Dye Corporation
Spencer Chemical Company
Standard Oil Company (Indiana)
Technical Tape Corporation
Thompson Chemical Company
Union Oil Company
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Research Center: Manorhaven, L. I., New York

SD126

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Pioneers in Lithium since 1901

MAYWOOD CHEMICAL WORKS
MAYWOOD, NEW JERSEY
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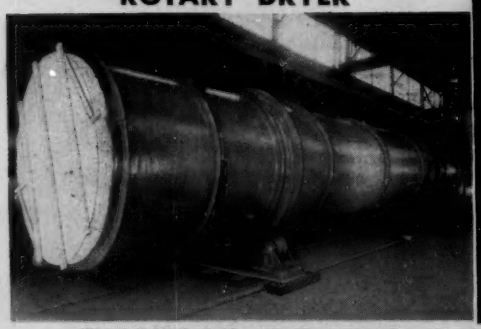
8' - 0" dia. x 48' - 0" long
DAVENPORT HOT AIR ROTARY DRYER



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Continuous DeWatering Presses
ROTARY DRYERS
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Atmospheric DRUM DRYERS
ROTARY COOLERS
Water and Air

DRYING ADIPIC ACID

To be assured that no contamination from iron oxide will be present in the finished product, the above unit has been fabricated from solid stainless and stainless clad steels. After fabricating, the unit has been thoroughly cleaned and ferroxyl tested. Openings are sealed to prevent any further oxide particles getting into the unit during shipment.

Let our engineers consult with you on your Pressing, Drying and Cooling problems or send for our catalog B For quick reference consult your Chemical Engineering Catalog.

davenport MACHINE and FOUNDRY COMPANY
DAVENPORT, IOWA U. S. A.

SALES

New York City area for fine chemicals produced by Purocaine, Inc. (Hockessin, Del.).

• The Braun Corp., a subsidiary of Van Waters & Rogers, will occupy a new, 21,000-sq.-ft. building at Phoenix, Ariz., as a base for distribution of industrial chemicals, laboratory supplies and scientific equipment.

• Cargill, Inc., and California's Board of Harbor Commissioners have announced a program for San Francisco port expansion that will include additional dock facilities for Cargill's copra plant and an office building to house all the company's maritime and farm product operations in central California. The San Francisco program is part of a five-year expansion of Cargill's seaport facilities in eight major cities.

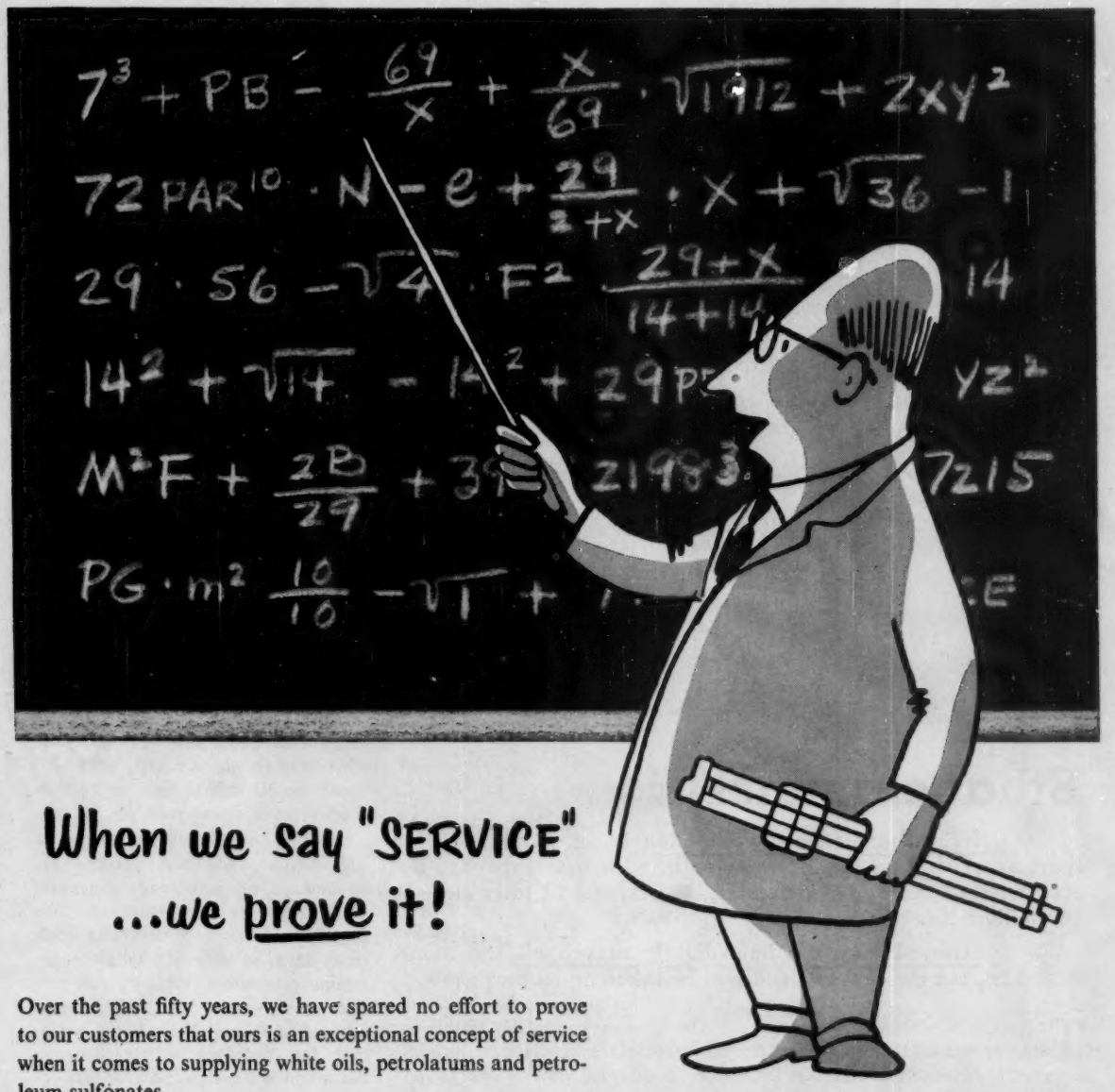
• Calvert-Mount Winans Co. (Baltimore) has named Jesse S. Young Co. (New York) as exclusive sales agent in the New York metropolitan area for alkyd resins and polyvinyl acetate polymers.

• Stein Hall & Co. (New York) has relocated its Montreal branch and established technical service facilities to serve Canadian printing and textile industries.

• Archer-Daniels-Midland has just completed consolidation of its Kansas City, Mo., offices. The new office, located on the eighth floor of the Centennial Bldg., brings together the activities of the flour and feed, alfalfa, resins and plastics and chemical products divisions in the area. A-D-M's grain division is not involved in the consolidation.

• The U.S. Air Force has established an office in the Hancock Bldg. in Niagara Falls, N.Y., to administer all Dept. of Defense contracts held by the Aviation Division of Olin Mathieson Chemical Corp. The Navy has turned over the local administration of its contracts with Olin to this Air Force office. Among the large defense contracts that the office will administer is one for construction near Niagara Falls of a $36-million chemical fuel plant for the Air Force.

• Dow Chemical's mining and metallurgical laboratories (technical service and development group) have been transferred from Pittsburg, Calif., to Midland, Mich. Purpose of the move: closer liaison with the company's other research and development groups.



When we say "SERVICE" ...we prove it!

Over the past fifty years, we have spared no effort to prove to our customers that ours is an exceptional concept of service when it comes to supplying white oils, petrolatums and petroleum sulfonates.

As proof of this contention, we have grown steadily, until today we are among the world's largest *specialists* producing these products. As such . . .

—we have a wealth of experience accrued over many years that we are ready to place at your disposal.

—we maintain laboratory facilities to help our customers solve their individual problems.

—we offer a wide range of these products—and will tailor-make them, if necessary, to meet your specific requirements.

. . . That our concept of service fits in with your needs, we stand ready to prove . . . if you will but telephone, wire, write, or fill in the coupon!

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White Oil, Petrolatum & Sulfonate Div.
L. SONNEBORN SONS, INC., Dept. CW12A
300 Fourth Avenue, New York 10, N. Y.

Gentlemen:

Will you please send me Technical Data on the following:

☐ "General Information on White Mineral Oils" I.R. Bulletin "A"

☐ "General Information on Petrolatums" I.R. Bulletin "B"

☐ "General Information on Petroleum Sulfonates" I.R. Bulletin "G"

What can you do to help me solve this problem?

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_____

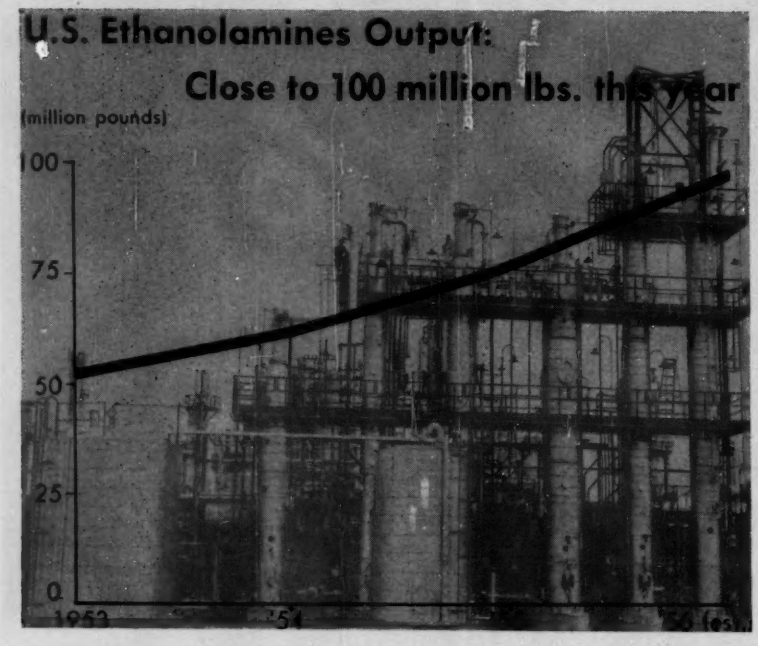
_____

Name.....

Company.....

Address.....

City.....Zone.....State.....



Ethanolamines Head Up

U.S. ethanolamines production is on the verge of a spurt as expanding producers come in with new capacity. But even without this added potential, '56 output will tally close to 100 million lbs.

Demand may not immediately absorb all the mono, di and tri, but the supply slack will be taken up as uses grow.

TOTAL U.S. ethanolamines capacity, by the end of this year, is expected to hit nearly 150 million lbs. Actual production, however, will tally closer to 100 million lbs., and most of that—following the trend noted in the last year or so (*CW June 4, '55, p. 89*)—will be allocated to the production of diethanolamine.

Reason for the apparent wide gap between total output expectations and capacity for this year: Carbide and Carbon, currently the nation's largest manufacturer of mono-, di- and triethanolamine, won't start operations at its new Seadrift, Tex., plant until next month.

Although the company is mum on precisely how much of these important chemical building blocks it will turn out—says merely that the new installation will double its capacity—the trade estimates Carbide's upcoming potential at 90 million lbs./year.

On the other hand, Olin Mathieson, newcomer in ethanolamines production, announced several weeks ago that a new unit at its Brandenburg, Ky., plant is producing all three ethanolamines. No official figures are available here either, but a good estimate is that Olin can produce 7-10 million lbs./year.

Dow Chemical, whose present capacity is likely 20-25-million lbs/year, has revealed that it will produce these amines as part of a sizable ethylene derivative expansion at its Texas Division in Freeport. How much the new production will add to Dow's present capacity is a matter for speculation. The company will say only that it will be a "substantial" increase.

Meanwhile Jefferson Chemical, within the last year or so, doubled its productive capacity to an estimated 20-30 million lbs./year. Of all the producers, Allied Chemical appears to be the only one that has not jumped on the ethanolamines expansion bandwagon; its capacity is rated at a conservative 10-12 million lbs./year. But there is trade talk that an important midwestern chemical firm is seriously considering making ethanolamines. All told, present and planned expansion reflects the impressively increasing demands of a growing market for these versatile products.

Diethanolamine, in point of demand, is currently the most important of the ethanolamines (*see box p. 86*); production is expected to hit 38-40 million lbs. in '56, nearly 10 million lbs. more than last year. That's nearly 40% of the total U.S. ethanolamines output for the year. And the bright outlook for the future reflects from the tremendous growth of liquid detergents, DEA's biggest outlet.

Clean Markets: In 1950, for example, nearly 2 million gal. of liquid detergents were sold. This figure spiraled upward to 18 million gal. last year. This year should see such sales skyrocket to 30 million gal.—more than a 66% jump in one year.

Another use for DEA is in purifying natural, flue and process gas streams. Gas scrubbing processes, trade observers have estimated, take anywhere from a conservative 25% to as much as 40% of total diethanolamine production. Refinery gas producers, however, are using more monoethanolamine than di for scrubbing out hydrogen sulfide. Reason: the mono is easier to recover and reuse than the DEA.

Textiles also take a good chunk of total DEA output, approximately 15%. These amines are used as emulsifiers in bleaching baths, as cleansers for various textile materials,

Estimated Ethanolamine Use

	1951	1953	1956
Mono	27%	37%	34%
Di	18%	31%	40%
Tri	55%	32%	26%

Dressing table by Brunovan, Inc.

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She'll be sitting pretty! And the attractive whiteness that brings out the gracious lines of her period furniture is no accident. It's the TITANOX white pigment that makes the finish hide so well and look so good.

TITANOX is the No. 1 choice in white pigments not only for furniture finishes but also for all paints, plastics, ceramics, paper, rubber and anything that needs white pigment. Titanium Pigment Corporation (subsidiary of National Lead Company), 111 Broadway, New York 6, N. Y.; Atlanta 5; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1; Vancouver 2.

*TITANOX *is a registered trademark for the full line of titanium pigments sold by Titanium Pigment Corporation.* 4202

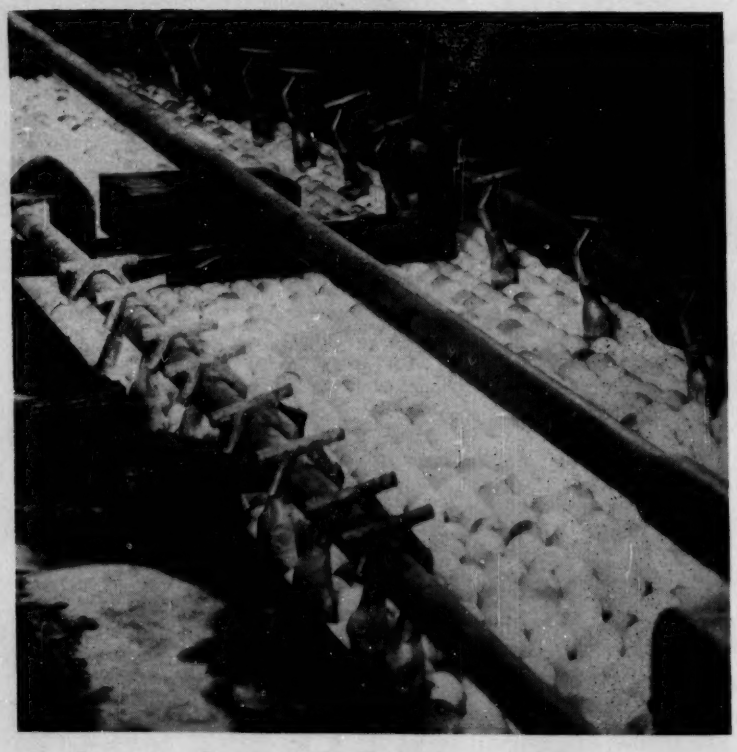
moth-proofing, and to render fabrics antistatic.

Another small but growing outlet has resulted from captive use of DEA in the production of morpholine (by only two companies). No output data is available on this "specialty" amine —which is used as an emulsifier for rubless waxes and polishes and as an intermediate—though it's estimated that some 4-5 million lbs. of DEA will be used in its production this year.

Other diethanolamine uses: in pharmaceuticals, plasticizers, corrosion inhibitors and herbicides. All these combined take about 10% of total DEA available.

Second Place for Mono: This year, monoethanolamine, one-time EA leader, will again be second to DEA in production—34-million lbs. That's about 9 million lbs. (about 36%) more than was made last year. A chief outlet for MEA is its use as an acid gas absorbent in the purification of natural gas and crude petroleum that contain hydrogen sulfide and sulfur. This year, about 15 million lbs. will go into that market; considering that that amount is more than 40% of total '56 MEA production, it's easy to see why prospects for MEA tie in closely with its continued use in the petroleum and natural gas industries.

MEA is also used in the recovery and concentration of carbon dioxide. (This year's production of carbon



Polyethylene Blanket

HOLLOW SPHERES of polyethylene—used to smother corrosive and noxious fumes from metal-plating tanks—provide a new outlet for the plastic, help push consumption of it toward an estimated 450 million lbs. in '56.

Some reasons why polyethylene was selected for the job: it's highly inert to strong acids and other chemicals, it's lightweight, has adequate strength over a wide temperature range.

About 55 of the 1.5-in. spheres (made of Bakelite polyethylene by Cosom Industries, Minneapolis) are needed to cover 1 sq. ft. of solution.

DOES *THIS* CONCERN *YOU?*

It does, indeed, if you have any unpleasant industrial processing or product by-odors to contend with. It concerns you because the practical advantages to be gained from effective control or neutralization of bad odors far outweighs, in most cases, the small cost involved. A representative of our Industrial Odorant Division will be glad to discuss with you the use of specially formulated odorants and the newer techniques of effective odor control. A word from you detailing the nature of your problem will help us to help you.

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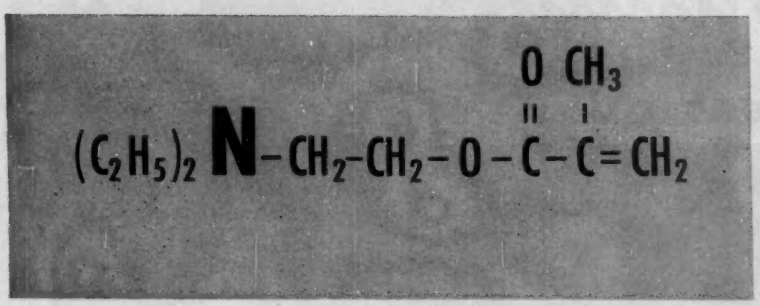
CAN YOU PICK THE RIGHT ANSWERS IN THIS

30-Second Quiz on Intermediates?

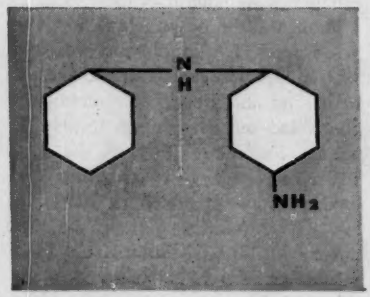


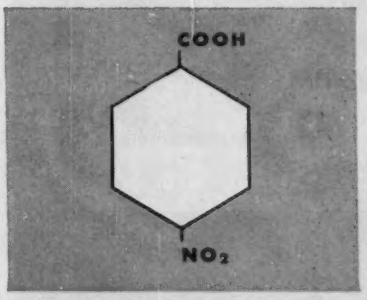
1. Above you see the formula for Du Pont 2-Diethylaminoethylmethacrylate. A real long fellow—a real useful one, too. Chemists are finding it very helpful as:

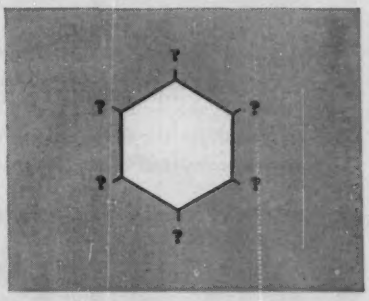
- ☐ **A.** Catalyst in petroleum refining
- ☐ **B.** Means of incorporating a basic site into a polymer
- ☐ **C.** A weed-killer ingredient

2. Is the problem of making your own reduced chemicals slowing you down? A sure way to free yourself is to:

- ☐ **A.** Leave them oxidized
- ☐ **B.** Devote still more time to the problem
- ☐ **C.** Consult Du Pont







3. Du Pont p-Aminodiphenylamine is used for a number of important uses. Among them are:

- ☐ **A.** Building block for antioxidants
- ☐ **B.** Dispersion medium for colloids
- ☐ **C.** Promoter in polymerization of polyesters

4. Meet Du Pont p-Nitrobenzoic acid. You may have heard about its use in:

- ☐ **A.** Stabilizing polyvinyl chlorides
- ☐ **B.** Preparing local and topical anesthetics
- ☐ **C.** Emulsion stabilizing

5. Suppose you have an unusual intermediate in mind. Your first move should be:

- ☐ **A.** Write Du Pont
- ☐ **B.** Consult Du Pont
- ☐ **C.** Call Du Pont by phone

• If you have a problem with intermediates, be sure to contact Du Pont—manufacturer of the greatest variety of these chemicals offered by any company. Our resources are at your disposal in finding, or even in manufacturing, the intermediate for your own specific needs.

Now, let's check your score on the quiz. Here are the answers: 1-B; 2-C; 3-A; 4-B; and 5—just take your choice!

Du Pont offers a complete line of intermediates containing nitro, amino and sulfo groups. And our specialists are always ready to give you a hand in selection and application—just drop us a note and we'll gladly try to help: E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Dept., Chemicals Div., Wilmington 98, Delaware.

DU PONT
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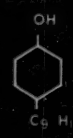
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

ORGANIC CHEMICALS DEPARTMENT

Intermediates

OF THE HIGHEST QUALITY

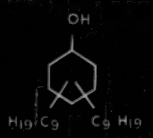
Nonylphenol



M.W. 220

For the manufacture of anionic and nonionic detergents; lubricating oil additives, antioxidants and petroleum demulsifiers, and for the manufacture of resinous polymers for use in protective coatings and plasticizers.

Dinonylphenol



M.W. 346

N-Methyltaurine 22
N-Methyltaurine 55

$CH_3-N(H)-CH_2-CH_2-SO_3Na$

Intermediate for the manufacture of dyestuffs, detergents, pharmaceuticals, and other organic compounds.

Isethionic Acid, Sodium Salt $HO-C(H,H)-C(H,H)-SO_3Na$

Intermediate for the manufacture of industrial and household detergents.

Sarcosine, Sodium Salt $CH_3-N(H)-C(H,H)-CO_2Na$

Intermediate for anionic surfactants and stabilizer for Rapidogen® dyestuffs.

THESE FIVE INTERMEDIATES ARE COMMERCIALLY AVAILABLE IN TANK-CARS OR CARLOADS. THEY REPRESENT BUT A SMALL FRACTION OF ANTARA'S COMPLETE LINE.

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dioxide should hit close to 900,000 tons because of its increased usage in food storage, carbonated beverages and industrial refrigeration.)

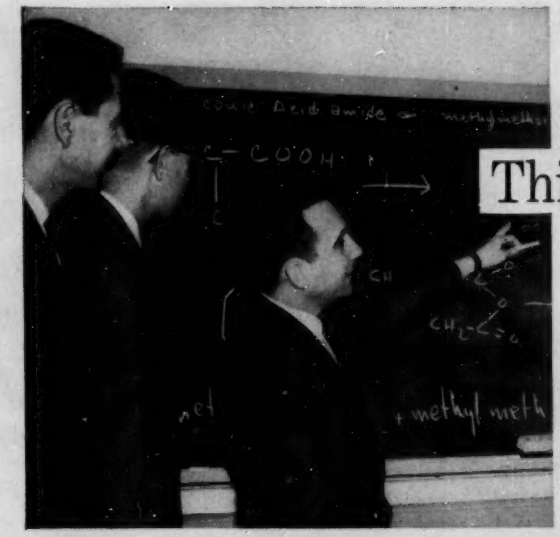
Another "big-time" outlet for monoethanolamine is, of course, the fast-growing synthetic detergents field. Marketers estimate that close to 9 million lbs. of the mono will be used in '56 in the production of various types of syndets. With sales of the latter expected to hit close to 3.5 billion lbs. over the next five years, mono use will grow concomitantly.

Monoethanolamine is also used in pharmaceuticals, toiletries, rubber accelerators, emulsifiers for the preparation of various insecticidal and fungicidal compositions. These miscellaneous uses of mono, too numerous to classify or even estimate individually, will take a 10-million-lb. chunk of '56 MEA production.

Triethanolamine, low man on the ethanolamine pole, may total some 25 million lbs. in output for '56. Two years ago, TEA production was only 16.6 million lbs. Reason for this jump: expansion and growth of a number of diversified outlets. Biggest (nearly 13 million lbs., about half of the total TEA output) is the cosmetic and toiletry industry, which in 1950 had total retail sales of $1.8 billion, but this should hit $2.7 billion. TEA is also an important emulsifier for the plastics industry.

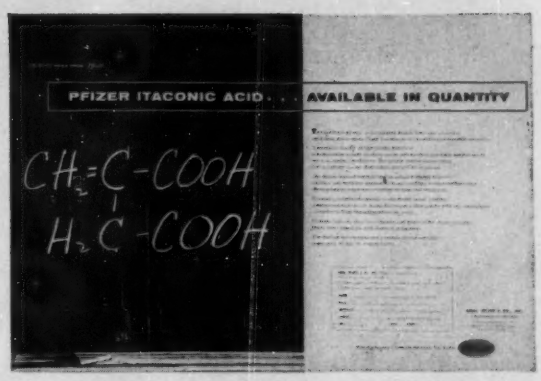
The pulp and paper industry, chalking up a record 40 million tons of production this year, uses TEA in the waterproofing of paper and pulp products. TEA and MEA are used as emulsifying agents for all types of waxes and polishes for automobiles, furniture, metals, etc. Other industries leaning toward more TEA use: rubber, (for dissolving rubber and in the preparation of rubber cement and compositions); pesticides (Dow uses it captively as a solubilizer for 2 4-D salts used in herbicide formulations).

Overall ethanolamines today are heading for new highs both in production and consumption. And though some anticipate overcapacity when all abuilding and planned facilities begin operations, the gap between potential supply and demand should close rapidly. There's no better stimulant for healthy growth than a booming economy, and mono-, di- and triethanolamine have a stake in just about every segment.



This was April, 1955...

"Pfizer team probes low-cost fermentation to make industrial itaconic acid...
enthusiasm among potential customers is running high...early investigators are unanimous in agreeing that it's a highly versatile building block."—from Chemical Week, April 2, 1955.



Then this announcement of the availability of itaconic acid brought hundreds of requests for samples.*

AND NOW, a reduced price for Pfizer Itaconic Acid

● Through the development of a new high-purity technical grade of Pfizer Itaconic Acid, it **is now possible to purchase this versatile chemical at approximately twenty-five per cent less than before.** (The refined grade is, of course, still available and its price has been markedly reduced.)

All this means that your production men should take a close look at the advantages your chemists have found in this versatile compound.

Two carboxyl groups, a conjugated double bond and an active methylene group make Pfizer Itaconic Acid a reactive and versatile molecule.

It esterifies readily in high yields. Esters of low-molecular weight alcohols can be polymerized and fatty alcohol esters serve as useful plasticizers. Polyhydric alcohol esters form thermosetting resins. Monoesters can also be prepared.

The double bond of the acid and its esters is highly reactive; addition polymers are possible with acrylonitrile, methyl methacrylate, vinyl chloride, vinylidene chloride, styrene and butadiene.

***IF YOUR CHEMISTS HAVEN'T YET TESTED PFIZER ITACONIC ACID, SEND NOW FOR A FREE ONE-LB. SAMPLE AND/OR TECHNICAL BULLETIN #82.**

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For Blanketing Fire in Chemicals, Gasoline, Oils

These pictures were taken at Robins Air Force Base in Georgia during acceptance tests of a Grinnell ProtectoFoam System. Above, a man slogs through foam to check the spray pattern produced by over 800 nozzles discharging 75,000 gallons of foam per minute.

With a ProtectoFoam system, a vapor tight blanket of foam floats on liquids and clings to solids, extinguishing flames and preventing re-ignition. It is particularly effective against fires in gasoline, oils, and chemicals.

The foam, a harmless mixture of water and a protein base foaming agent, is produced mechanically by special Grinnell nozzles. When the foam compound has been used up or shut off, these nozzles then discharge water in the same manner as standard open sprinklers. Once the fire is out, the water discharge may be used to wash down the building and equipment and clean away the foam.

ProtectoFoam is only one of many Grinnell Fire Protection Systems designed for special hazard application. For unbiased advice on your fire protection problems, write to Grinnell Company, Inc., 288 West Exchange Street, Providence, Rhode Island.

Foam flows under aircraft to form a complete blanket.

Truck breasts hub-deep foam blanket outside hangar. Foam will dry out and disintegrate to a powder.

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Manufacturing, Engineering, and Installation of Fire Protection Systems since 1870

Market Newsletter

CHEMICAL WEEK
November 24, 1956

Stand-by emergency measures to cope with natural rubber shortages that may result from the Suez Canal shutdown may be set up after all. Last fortnight, Defense Mobilization Chief Arthur Flemming was ready to turn down a modified industry plan to extend—from 2 to 4 months—the delivery periods for replacement of rubber taken by consumers under the stockpile rotation program (*CW Market Newsletter, Nov. 10*).

Now Flemming is leaning toward okaying the time extension, would let stockpile managers put it into effect at their own discretion.

Reason for the switch in attitude: government officials who scouted industry fears of shortages now feel a protracted canal shutdown will squeeze U.S. natural rubber supplies about next February—early in the busiest tire producing season.

U.S. synthetic rubber plants—government experts aver—will offset not only most of the natural rubber shortage here but also part of the more severe curtailment they think will hit European producers.

U.S. exports of synthetic rubber are running at a 14,000 tons/month clip—highest since World War II—and can be boosted another 5-10,000 tons.

But overseas sources discount predictions by U.S. government agencies that U.S. synthetic rubber sales to Europe will increase greatly in the coming months. So far, British manufacturers have made only "marginal inquiries" about additional supplies, indicating that their rubber stocks are more ample than tight (due primarily to England's motor industry recession).

Too, there seems little likelihood of increased demand for synthetic rubber from Germany, Italy or France; in the latter country, for example, present natural rubber stocks will probably fill normal needs until January, and new supplies have already been rerouted via the Cape of Good Hope.

•

An across-the-board increase on methanol prices, which most customers will hear about officially within two weeks, may herald, as expected (*CW Market Newsletter, Nov. 17*), the end of the mid-quarter price-changing lull.

The hikes, amounting to 2½¢/gal., are being initiated by one major producer, and will go into effect Jan. 1. New tabs, which no doubt will become industry standard since all producers have been hit by similar cost-raising factors, brings Eastern tank tags to 32½¢/gal.; c.l. in drums to 48½¢; l.c.l. to 55½¢/gal. Western customers can tack on an additional 3¢/gal. The changes will apply to both spot and contract orders.

Up, too, are tabs on sodium methylate. Effective Nov. 15 on spot purchases, Jan. 1 on contract deals, are 1¾¢/lb. increases posted by Olin Mathieson's Industrial Chemicals Division.

New listings for carload and truckload quantities, f.o.b. plant: 200-lb. net drums, 36¼¢/lb.; 50-lb. net drums, 39¼¢/lb.; 25-lb. pails, 42¼¢/lb.

•

But there's a break for buyers of sodium lauryl sulfate. Cuts of 2¢/lb. by American Alcolac—one of the largest sellers—bring price of the surfactant to 20¢/lb. l.c.l., 19¢/lb. in truckloads, 18¢/lb. in tanks.

The decrease is attributed to an increase in sales volume (largely due to greater demands by the cosmetic industry), a wish to "expand and broaden markets," and, of course, keener competition.

•

Sweden will get a big slice of the 7 million cc. of Salk vaccine exported this quarter by the U.S. Of more than 4 million cc. already licensed by the U.S. Dept. of Commerce, Sweden will get more than 1 million and Switzerland will get 130,500; each will use its allotment to launch an immunization program.

The rest of the 4 million cc. will be used to expand existing immunization programs in Argentina (about 2.5 million cc.), Brazil, Costa Rica, Finland, Guatemala, Iceland, Israel, Norway, Panama, Uraguay and Venezuela.

•

First U. S. plant for the oxidation of Fischer-Tropsch waxes has been put onstream by Aerogon Chemical Industries (New York), will make emulsifiable products suitable for dry-bright polishes. Waxes from South Africa's Sasol facilities will be used as raw materials (*CW, Aug. 25, p. 76*). Price range for the oxidized waxes is 39-42¢/lb.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending November 19, 1956

	Change	New Price
UP		
Casein, Argentine, bgs., c.l.	$ 0.01	$ 0.25
Ferric ammonium citrate, brown, pearls, NF, gran., dms.	0.05	0.65
Peanut oil, crude, tks., f.o.b. mills	0.015	0.17
Sodium methylate, c.l., dms., f.o.b.	0.0175	0.3625
DOWN		
Carnauba wax, No. 3, NC crude	$ 0.06	$ 0.65
Sodium lauryl sulfate, tks., dlvd.	0.02	0.18

All prices per pound unless quantity is stated.

120 TONS OF UREA PER DAY
from Turba-Film Processor at Sohio Petrochemical Plant

The Turba-Film® Processor has important advantages over conventional equipment in this application.

90% solids produced quickly, economically and continuously...

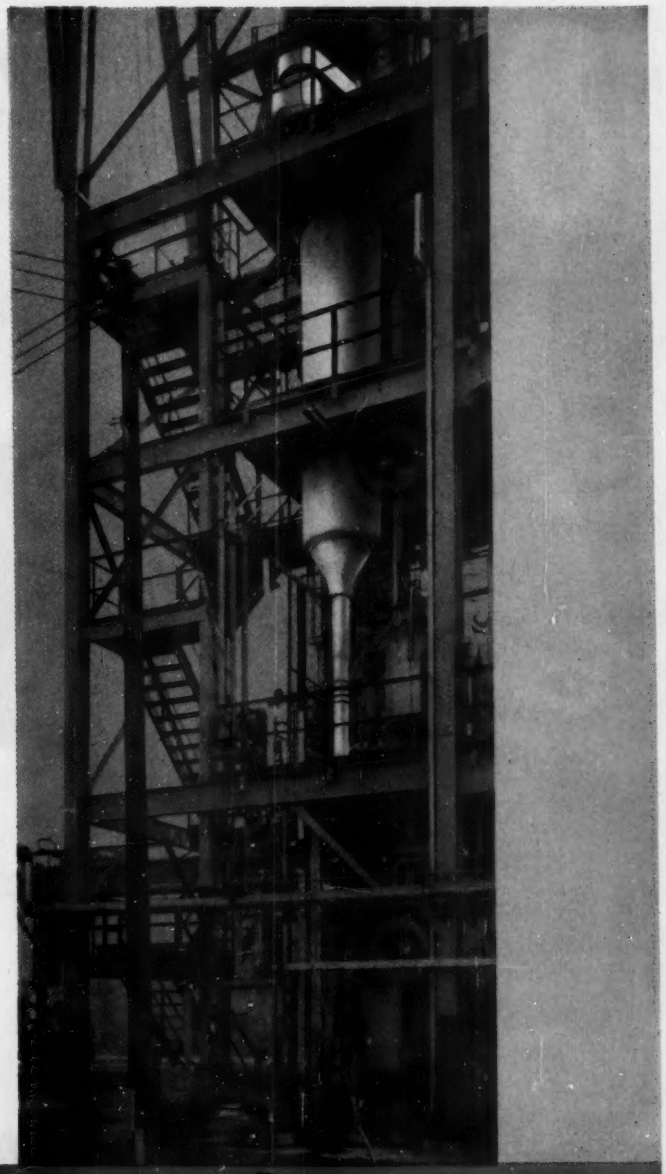
Relatively low temperature prevents degradation of the urea.

Low operating cost, unfailing reliability, and simple operation.

The Vulcan Inventa process, used by Sohio, overcomes two major difficulties which have hampered urea production: (1) Rapid and severe corrosion in the reactor where ammonia and carbon dioxide are combined under high temperature, and (2) difficulty of separating the unreacted carbon dioxide and ammonia. The Turba-Film Processor plays an important part in the system.

The No. 6 Turba-Film Processor constructed of Type 304 stainless steel dehydrates the urea solution and controls the biuret content. From the Turba-Film Processor, urea goes to the prilling tower, is then bagged or packaged. The total output is uniformly high grade urea.

Rodney Hunt Machine Co.'s Process Equipment Division is prepared to engineer, fabricate and erect complete package-type systems involving application of the Turba-Film Processor in continuous processing. Write for full information or telephone collect.



RODNEY HUNT MACHINE CO.
Process Equipment Division
29 Vale Street, Orange, Massachusetts, U. S. A.

RODNEY HUNT

Creative·Chemical

Marketing *in action . . .*

The flexibility of the chemical producer is vital when a customer needs an extra car of material in a hurry . . . and before fastest shipment can arrive from the plant. The Traffic Department must locate a similar shipment in transit and "detour" it to the customer. Then, in order to re-establish the distribution pattern, other cars may be re-routed and shipping schedules adjusted.

Ability to handle such situations depends on efficient management of transportation facilities that link a score of producing points with customers' plants. Alert control of a rail, water, and highway fleet is essential in regular operations . . . it can also prove invaluable in emergencies.

See how Creative Chemical Marketing can help you

Olin Mathieson's imaginative approach to the logistics of the chemical process industries produces results. A review of your current and long-range requirements may show that you can buy to better advantage. For a detailed analysis, we suggest you contact the Chemicals Executive Office in Baltimore.

MATHIESON CHEMICALS
OLIN MATHIESON CHEMICAL CORPORATION
INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.

INORGANIC CHEMICALS: Ammonia • Bicarbonate of Soda • Carbon Dioxide • Caustic Potash • Caustic Soda • Chlorine • Hydrazine and Derivatives Hypochlorite Products • Muriatic Acid • Nitrate of Soda • Nitric Acid • Soda Ash • Sodium Chlorite Products • Sulphate of Alumina • Sulphur (Processed) Sulphuric Acid • ORGANIC CHEMICALS: Ethylene Oxide • Ethylene Glycols • Polyethylene Glycols • Glycol Ether Solvents • Ethylene Dichloride • Dichloroethylether Formaldehyde • Methanol • Sodium Methylate • Hexamine • Ethylene Diamine • Polyamines • Ethanolamines • Trichlorobenzene • Polychlorobenzene • Trichlorophenol

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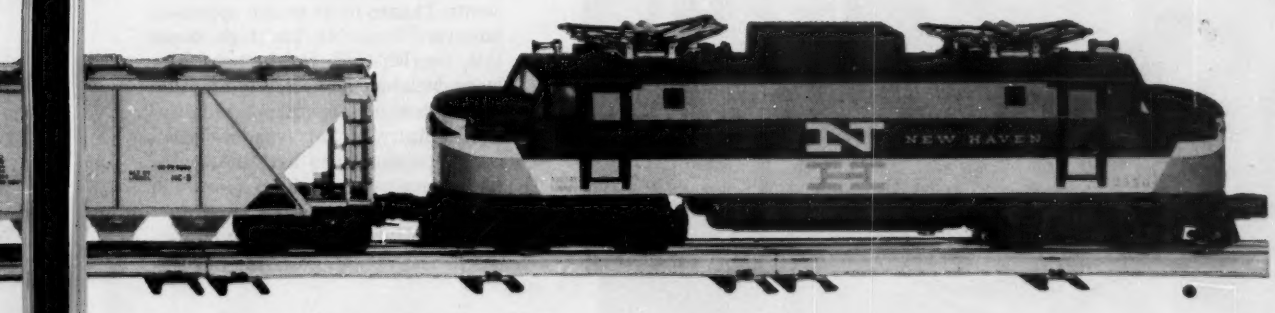
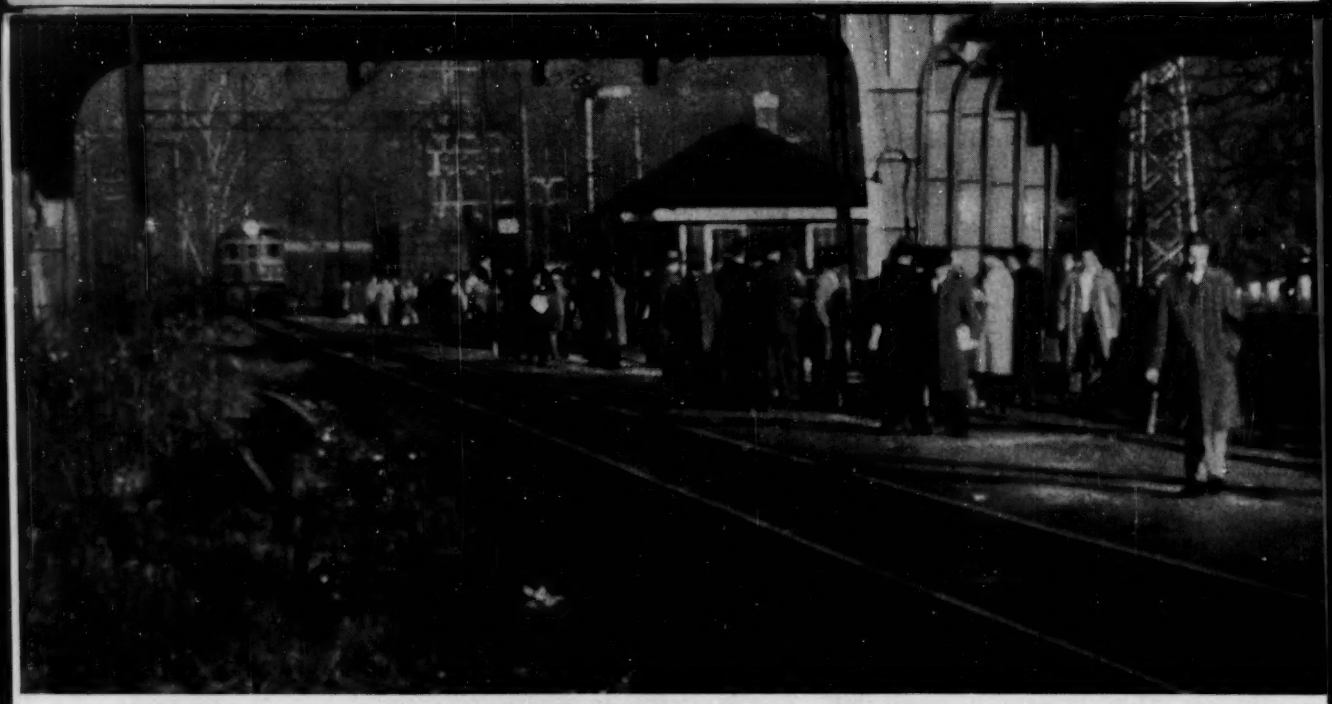
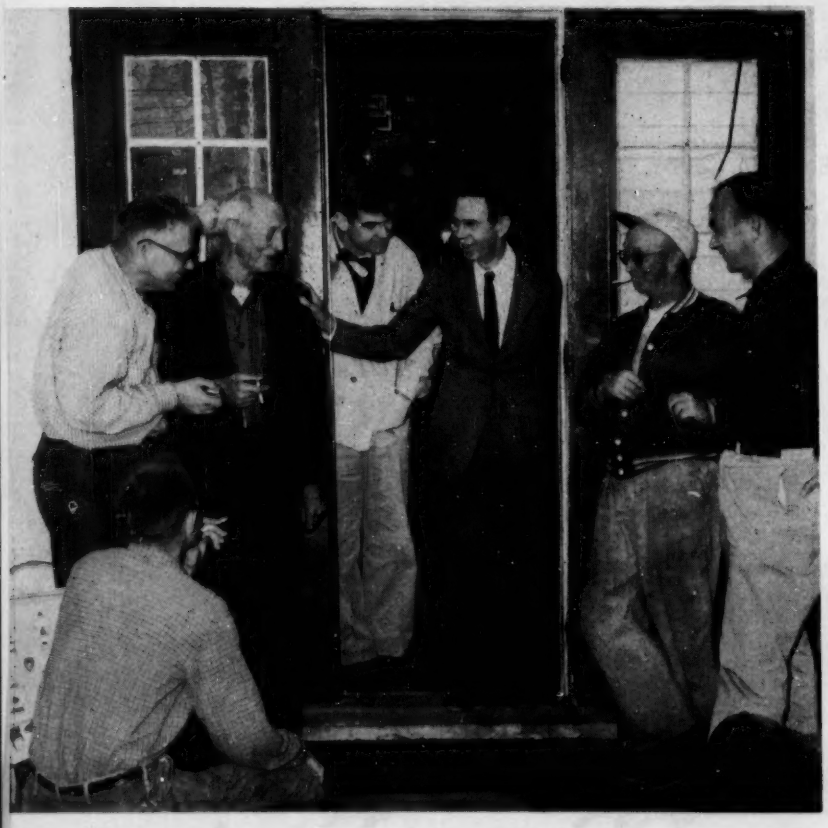




COMMUTERS comprise hard core of Wilton, Conn., opposition to Escambia's proposed lab.

Embryo Research Center Stirs Up

TRADESMEN in general look favorably on the lab.

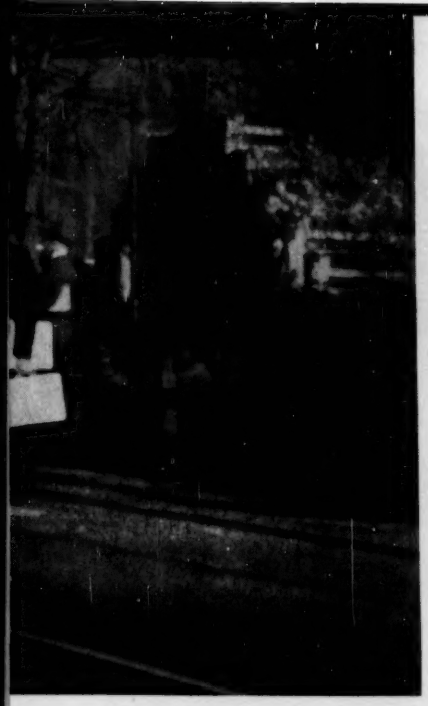


In the quiet Connecticut town of Wilton this week, Escambia Chemical Corp. was parleying with an uneasy citizenry. Under discussion is the new $1.5-million plastics and petrochemicals research center the company wants to locate there.

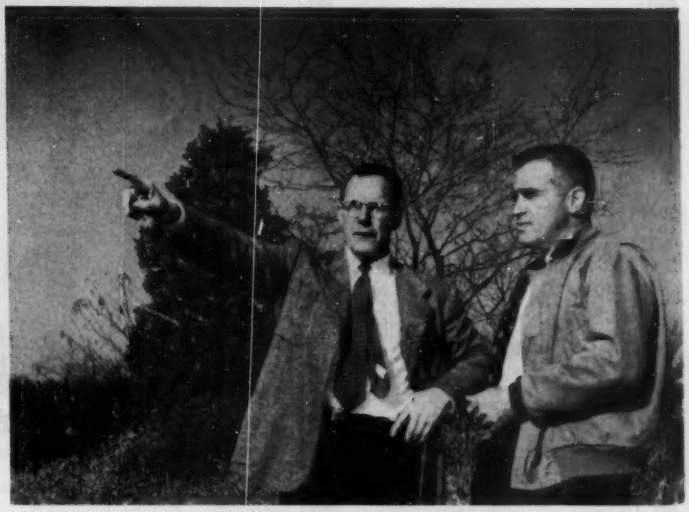
It's another case that proves that building a lab in the suburbs is a lot more complicated than merely picking the right architect. Desirable sites are getting scarcer; tight zoning restrictions, antipathy by townspeople, competition for available land, are other potential problems. But the experiences of chemical process firms that have tackled these obstacles successfully can serve as valuable guideposts if you're trekking to the country

Escambia's sortie into country-like Wilton (about 50 miles from New York City) has created something of a stir among the town's 6,500 residents. Thanks to its tactful approach, however, Escambia has high hopes that the lab will go through. Like many high-income commuters' towns, Wilton has no zoning provision for light industry of any type. Escambia is now petitioning to have the zoning rules amended to include a research and development district.

Here's How: Escambia's president, Robert Haslangor, and assistant re-



RESEARCH



LOCAL LAWYER helps firm minimize resentment.

ı Small Town

search director, Horace Boynton, are guiding the move to Wilton. Their philosophy: obvious sincerity, willingness to understand the town's viewpoint, and a desire to cooperate. So far, they have followed these steps:

• Met informally with various town groups prior to appearing before the townspeople at a public meeting. Escambia representatives first talked with people who live adjacent to the property under consideration for the lab site, then met with local residential associations, next with other residents. After that, they conferred with members of Wilton's planning board and finally appeared at a town meeting. Haslangor and Boynton are convinced this gradual approach helped a lot in building favorable opinion for Escambia's case.

• Explained carefully the nature of the new laboratory, stressing that it is not a factory or manufacturing operation. Cautions Boynton: "Be prepared for considerable opposition to a pilot plant. To most Wilton residents, it sounds like a manufacturing operation."

"If possible," he advises, "arrange to have spokesmen for various groups take a trip to a research laboratory. Let them see what sort of work is done there." A prospective neighbor of Es-

EDITOR of local newspaper presents both sides

COMPANY PRESIDENT Haslangor steers project.

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RESEARCH leader Boynton urges gradual approach.

cambia's proposed lab who opposed the pilot plant changed his mind after a visit to the firm's Cambridge, Mass., laboratories. After returning home, he wrote the editor of the Wilton *Bulletin:* "(Formerly), I found it hard to dispel visions of some of the oil refinery equipment that one so prominently notices in traveling through the Newark and Elizabeth area of New Jersey . . . The visit left me well satisfied that we, as potentially close neighbors, have nothing to fear from the [proposed] location of [the] Escambia [lab]. It appeared to us that Escambia would constitute a decided asset to Wilton if the town officials should decide to modify zoning."

• Explained that extreme safety precautions are taken to prevent fires, fumes, air or river pollution, pointing out that pollution is carefully watched not only by company officials but also by insurance companies. Representatives of these companies are trained to look for danger spots, don't hesitate to point out incipient infractions. The company must listen or be faced with losing insurance coverage—something no company can afford.

• Hired a local lawyer to draw up and present its rezoning petition. This move, Escambia feels, helps overcome any impression of "trying to put something over by using a big corporation lawyer."

• Brought its architect to the meeting, had him show sketches of the building and discuss his landscaping plans. Most laboratories today are patterned on the style of a college campus. That's a sales point to counteract mental images of a dreary industrial building.

• Let the community know how many families can be expected to move into the area. This is helping Wilton residents to decide whether the tax benefits will outweigh the disadvantages. While a new lab may yield thousands of dollars in taxes, the need for new schools, etc., for staffers may outweigh such benefits. Boynton informed town officials that because Wilton is a high-cost city with a housing shortage, the firm's people would probably live in adjacent towns.

An Opposing Force: One of the first things Escambia learned is that the older residents of the town were easier to win over than the younger, more recent residents, many of whom commute to jobs in New York City. Hard core of this opposition is formed around the Wilton Residential Assn. It wants to preserve Wilton's character as a residential community, also feels that the land the proposed laboratory would be erected on may be needed for a retail center when the town grows to 20,000. However, even these people favor certain nonoffensive projects such as research laboratories (but without attached pilot plants), provided it can be shown that such projects will result in significant tax benefits to the entire community.

In answer, the local newspaper (although it did not openly come out for or against the petition) questions whether the association "represents the considered judgment of 200-300 mem-

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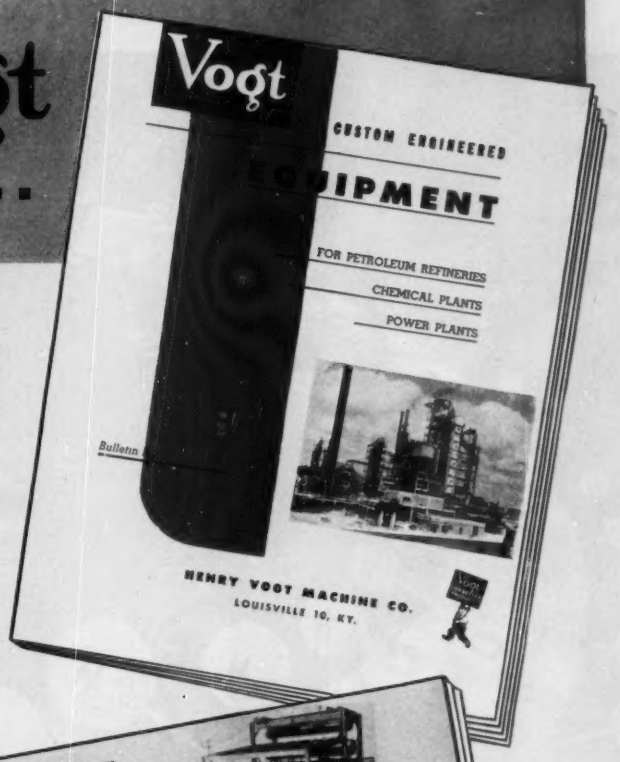

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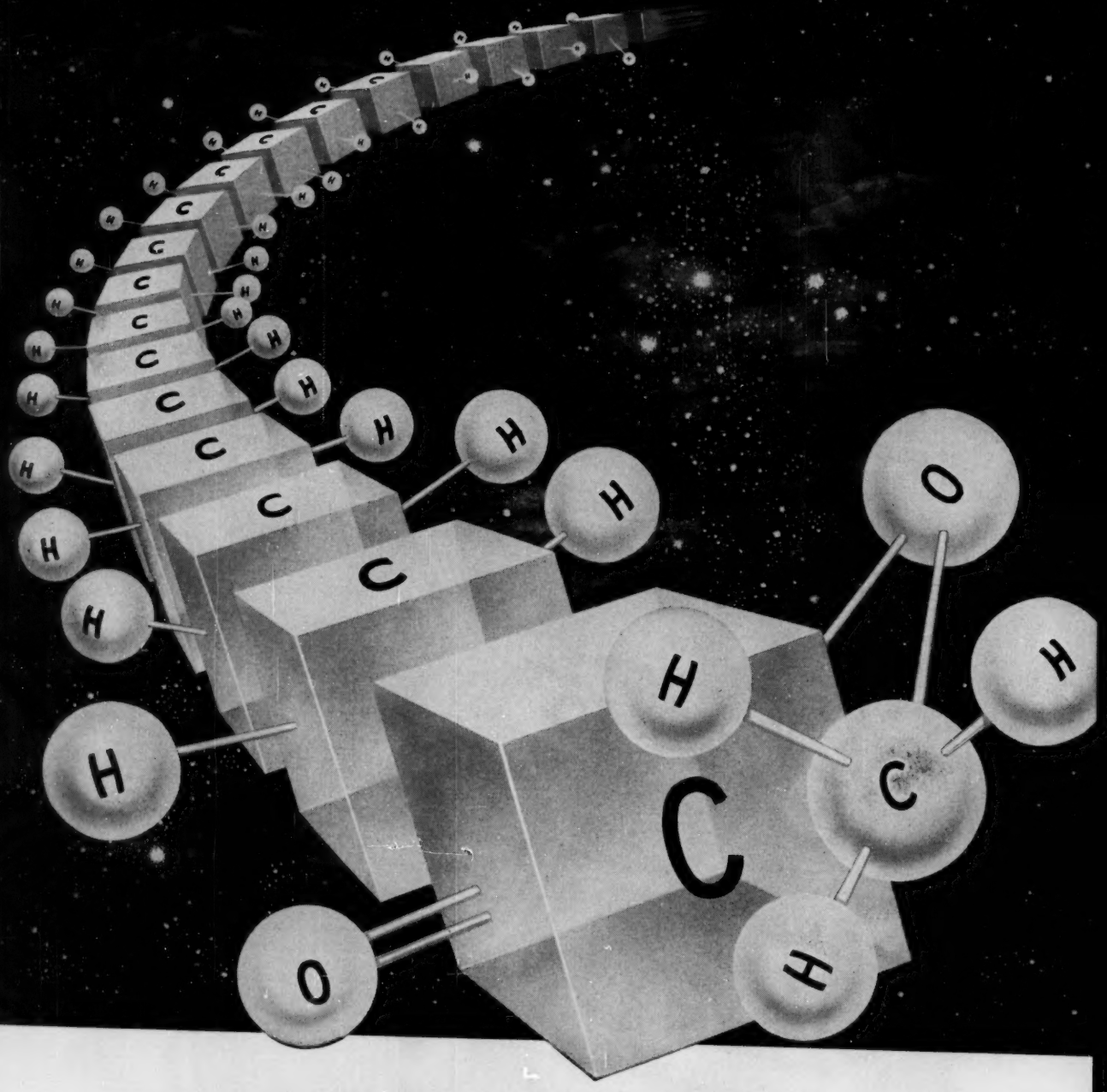

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ACID VALUE	0.6 Max.	1.0 Max.	0.5 Max.	1.5 Max.	2.0 Max.
SPONIFICATION VALUE	348-358	295-305	260-264	230-234	203-213
COLOR GARDNER MAX.	1	1	1	1	1
IODINE VALUE MAX.	0.5	0.5	0.5	0.9	4.0
% MOISTURE MAX.	0.1	0.1	0.1	0.1	0.1
TITER °C (Approx.)	−34.0	−16.0	3.0	15.0-18.0	25.0-30.0
% UNSAPONIFIABLES MAX.	0.2	0.2	0.3	0.3	1.0
% M. CAPROATE	1	—	—	—	—
% M. CAPRYLATE	94	3	—	—	—
% M. CAPRATE	5	94	2	—	—
% M. LAURATE	—	3	96	2	—
% M. MYRISTATE	—	—	2	94	3
% M. PALMITATE	—	—	—	4	93
% M. STEARATE	—	—	—	—	2
% M. OLEATE	—	—	—	—	2
% M. LINOLEATE	—	—	—	—	—

MIXED FATTY METHYL ESTERS	UNIPHAT A 25	UNIPHAT A 45	UNIPHAT A 49	UNIPHAT A 65	UNIPHAT A 76	UNIPHAT A 85
DESCRIPTION	M. Caprylate—M. Caprate	Coconut Methyl Esters	M. Laurate—M. Myristate	M. Palmitate—M. Stearate	M. Stearate—M. Palmitate	M. Oleate
ACID VALUE	0.8 Max.	0.5 Max.	0.5 Max.	4.0 Max.	5.0 Max.	1.0 Max.
SAPONIFICATION VALUE	330-345	246-256	258-262	195-210	195-203	188-194
COLOR GARDNER MAX.	1	1	1	4	4	1
IODINE VALUE MAX.	1.0	14.0	0.5	35.0-50.0	1.0	60.0-70.0
% MOISTURE MAX.	0.1	0.1	0.1	0.1	—	—
TITER °C (Approx.)	−34.0	−4.0	1.0	12.9	23.0-28.0	16.0-21.0
% UNSAPONIFIABLES MAX.	0.5	1.0	0.5	1.0	1.0	0.3
% M. CAPROATE	2	—	—	—	—	—
% M. CAPRYLATE	58	8	—	—	—	—
% M. CAPRATE	38	7	2	—	—	—
% M. LAURATE	2	45	90	—	—	—
% M. MYRISTATE	—	18	8	9	9	—
% M. PALMITATE	—	10	—	35	34	6
% M. STEARATE	—	2	—	18	57	29
% M. OLEATE	—	8	—	29	—	56
% M. LINOLEATE		2	—	9	—	9

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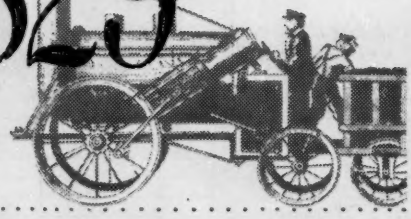
Important dates in the History of Industrial Progress

1829



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Color 5¼" Lovibond Yellow	15 max.
Color Gardner 1933	2–4
Unsaponifiable	0.25%–0.50%
Saponification Value	251–258
Acid Value	250–257
Iodine Value (WIJS)	7–15

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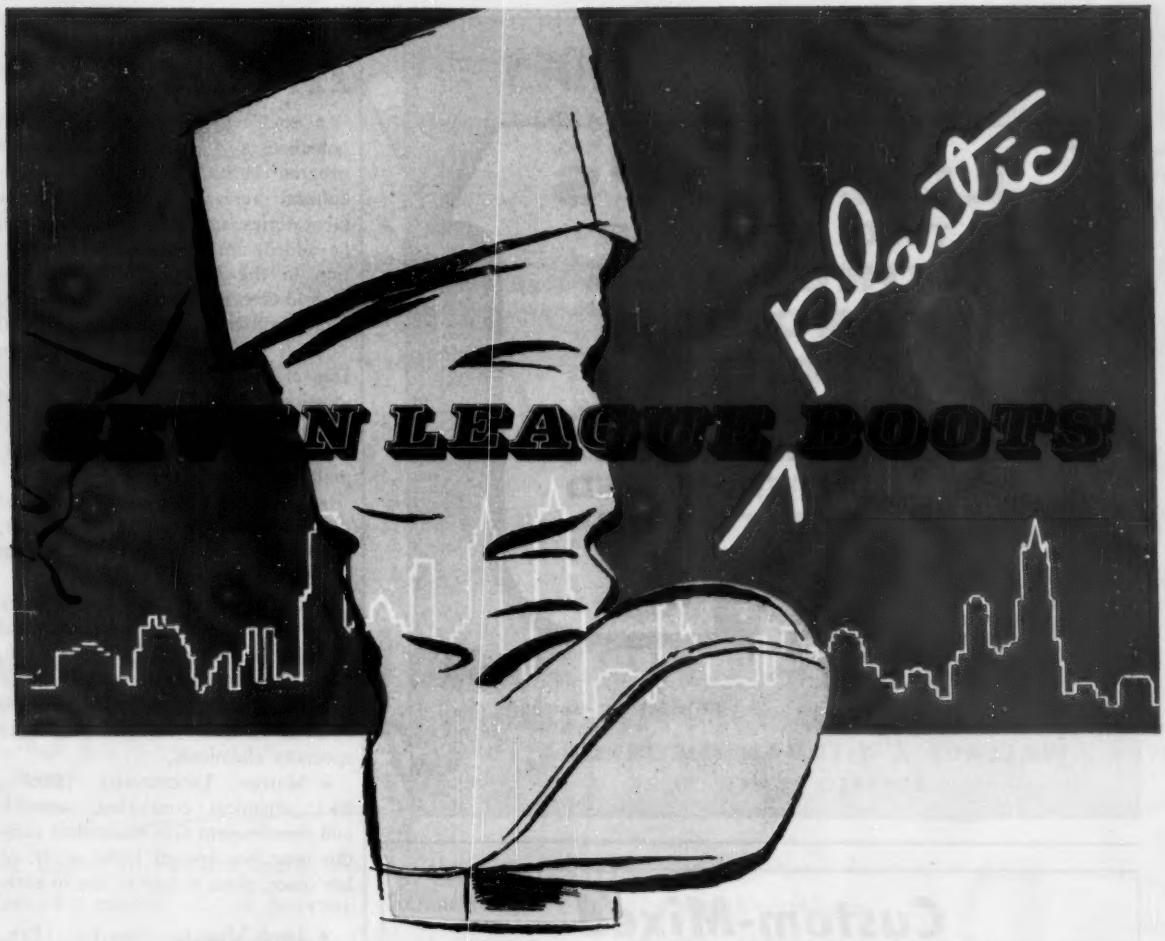
bers or only a half-dozen individuals."

For the Lab: Escambia's Wilton supporters, who include most of the natives of the town as well as many of the commuters, point to the area's zooming tax-rate increase—up some 300% in the past 10 years—as basis for their belief in the need for attracting taxpaying light industry in the form of research and development. They look upon the laboratory as an important step in the right direction; and—convinced that it won't be an undesirable addition—are willing to amend the zoning code to permit the company to settle on an available site.

Some of them are local merchants and businessmen. Although they may hesitate to speak at town meetings for fear of antagonizing customers, they're pretty unhappy about the tax hikes. Typical comment: "You can't build a fence around Wilton and keep it just for the millionaires."

In the New York area, at least two firms have successfully overcome problems similar to Escambia's. U.S. Rubber Co., for one, last month laid the cornerstone for its new research laboratory in Wayne Township, N.J. (*CW, April 24, '54, p. 101*), after more than two years of negotiating with the townspeople.

Colgate-Palmolive Co., preparing to start construction soon on a new laboratory at Bloomfield, N.J., first did a thorough job of explaining its case to town officials and residents—and gained town approval.



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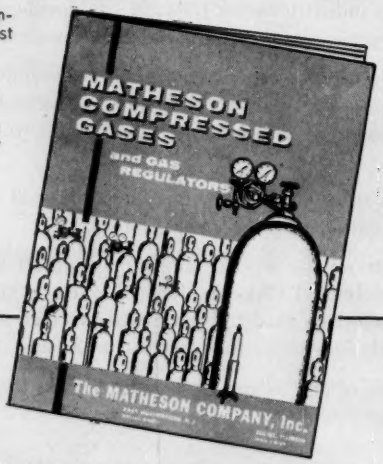

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RESEARCH

EXPANSION

• Shell Development Co. has launched a million-dollar expansion program at its Modesto, Calif., agricultural research center. Six new laboratories and office buildings will be added, are scheduled for completion in the fall of 1957. President Harold Gershinowitz says the enlarged center will bring more than 50 Shell families into the Modesto area from Denver and other company laboratory locations. A staff of more than 100 people—representing a payroll in excess of $1 million/year—will eventually be employed.

• Ohio Oil Co. recently dedicated its new research center at Denver, Colo., says its operation will cost more than $1 million/year.

• Catalin Corp. will spend more than $500,000 for a new chemical research laboratory at its Fords, N. J., plant. Recent entry into anti-oxidant and oil additive production, Catalin aims to diversify further, will study specialty chemicals.

• Marron Laboratories (Skokie, Ill.), chemical consulting, research and development firm established early this year, has opened 1,000 sq. ft. of lab space, plans to add to this in early 1957.

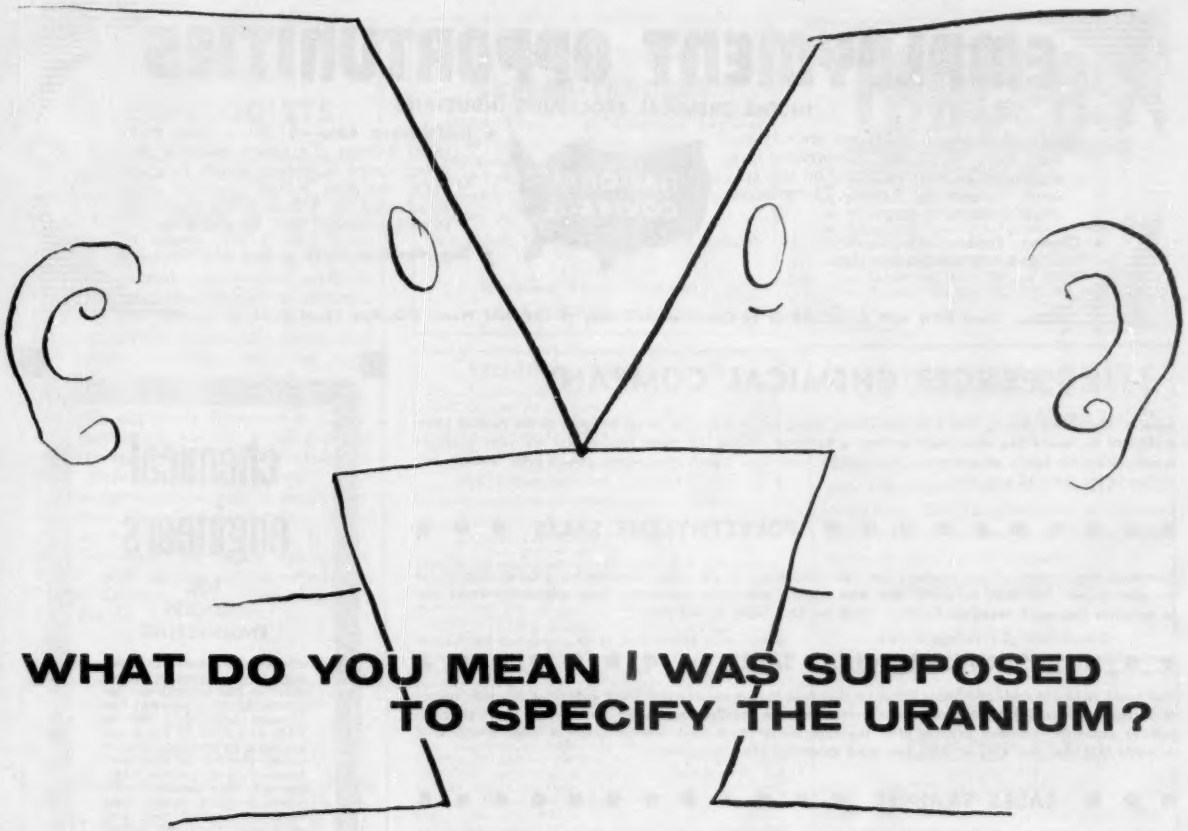
• Lord Manufacturing Co. (Erie, Pa.) has set up a special products division for research, manufacture and marketing of adhesives, chemicals and polymers.

• The Fluor Corp., the Los Angeles engineering-construction firm, is breaking into a new field, reports it will "actively seek" industrial contract-research in the petroleum, chemical and petrochemical industries. Applied, rather than basic, research will be stressed.

• Admiral Corp. has installed a 20,000-curie cobalt source (said to be the most powerful in the country) at its nucleonic laboratories in Chicago, will use it to study radiation damage to electronic components under a three-year Air Force contract.

• Atlas Powder Co. has filed an application for a permit to build a $3-million technical center next to its general offices in suburban Wilmington, Del.

• Columbia Southern Chemical Corp. will add a second story to its research and engineering building at Corpus Christi, Tex. Cost: $60,000.



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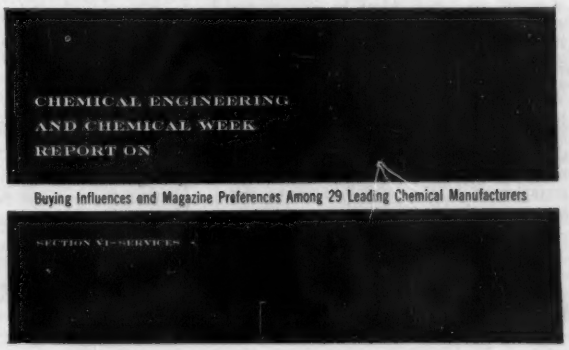
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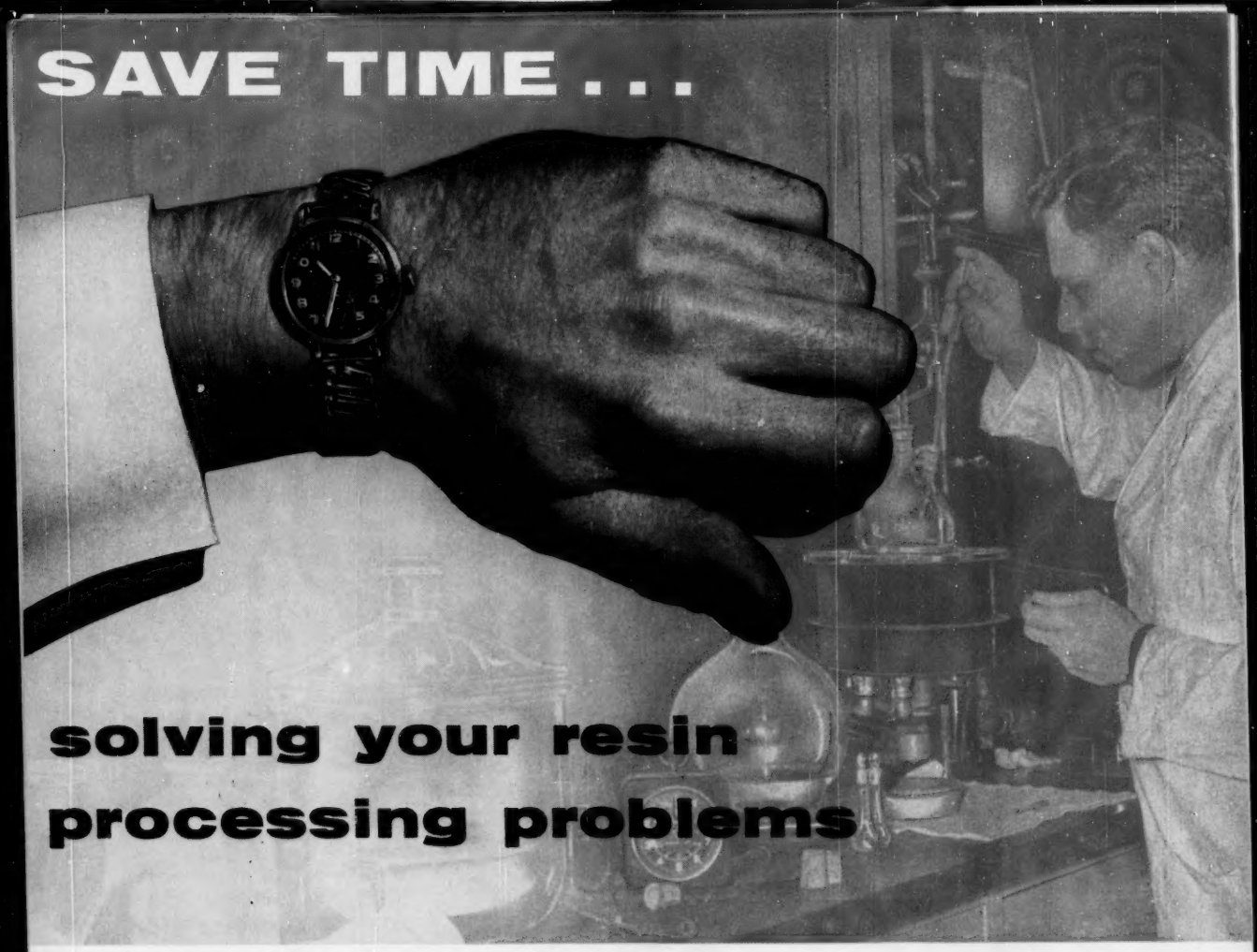

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